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ABSTRACT

A 1-year demonstration project involving 24 developmentally disabled students (9- to 20-years-old) with severe physical limitations was conducted to increase their educational and vocational possibilities by using cost-effective bio-engineering techniques to modify their physical environment and develop improved adaptive devices. Phase I of the project consisted of student selection, parent education, and initial evaluation of individual functional abilities. The second phase included using specially designed or commercially available adaptive devices (such as contour seats and wheelchair ramps) to increase functional independence; developing recreational programs (such as a miniature golf course); measuring functional improvement in 50 areas of self-care (such as dressing and eating); providing vocational orientation programs (including training in microfilming and one-handed typing); evaluating each student's functional and vocational potentials and recommending environmental and orthotic (supportive device) adaptations; and meeting of project advisors, staff members, parents, and students. Plans for the project's final phase focus on a practical workshop to demonstrate how low-cost, simple designed, bio-engineering adaptations can be used to increase the physically disabled individual's functional level and work capacity. (Provided are descriptions and pictures of adaptive devices used with individual students and 14 appendixes including sample forms for evaluating physical functioning and recreational interests.) (SB)

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FINAL REPORT



BIO-ENGINEERING SERVICES TO THE DEVELOPMENTALLY DISABLED ADOLESCENT



THE GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER
JOB DEVELOPMENT LABORATORY
WASHINGTON, D.C.

BIO-ENGINEERING SERVICES TO THE DEVELOPMENTALLY DISABLED ADOLESCENT

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I PROJECT PERSONNEL

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II GENERAL OBJECTIVES

The primary objective of this project is to increase the quality of life for developmentally disabled adolescents. The main means for accomplishing this goal is through the use of cost effective bio-engineering techniques and the introduction of the concept of vocational possibilities for developmentally disabled students at the Sharpe Health School in Washington, D.C. (the D.C. public school for physically and mentally handicapped children).

The goal is to increase the capability of individuals who are functionally impaired by: (1) restructuring of the environment, (2) providing orthotic or supportive devices to the clients.

Bio-engineering adaptations have both immediate and long-range benefits. The immediate benefits are to render a client functionally capable in an activity in which he was formerly dependent on others. The number of self-care activities and recreation skills which an individual can perform are increased whenever possible by making simple changes in his or her surroundings and by supplying supportive aids to increase functional ability both at school and at home.

A secondary objective is to achieve parental cooperation in order to restructure the environment. Parents as well as students are encouraged to participate in all phases including evaluation and recommendations. Parental cooperation helps to define both the student's and family's needs and results in more acceptance of the program. As a result of increased functional independence, less demands are placed on the family, which in turn reduces the student's feeling of helplessness. The family begins to view their child as potentially productive; the student gains confidence in his own ability to be self-sufficient; together they begin to think more constructively about a vocational future.

III SPECIFIC AIMS

- (1) To provide a basis for enhanced educational and vocational possibilities through the application of bio-engineering techniques in redevelopment of orthotic devices for adolescent developmentally disabled students who have severe physical limitations.
- (2) To demonstrate that through modification of the environment with adaptive devices, developmentally disabled students can be trained to function in a productive manner, thereby enhancing the quality of their lives.
- (3) To eliminate years of inactivity, unemployment, and dependence on family care for these students through early evaluation of work potential and by developing productive skills during the pre-vocational years.
- (4) To promote better parental understanding of the disabled adolescent student's potential and to redirect the family's thinking about immediate, future, and long-range goals for these students.

(5) To disseminate the above information to regional representatives of agencies dealing with developmentally physically disabled children at workshops to be held near the end of the project.

(6) To develop a permanent audio-visual resource file of related materials.

IV METHODOLOGY

The methodology of this research and demonstration project is divided into three phases (Diagram 1):

Phase -I. -(3 months) A. Selection of developmentally disabled adolescents

B. Parent education

C. Initial functional evaluation

PHASE II. (6 months) A. Utilization of adaptive devices to increase independence

1) Designed and constructed adaptive devices

2) Commercially available adaptive devices

B. Recreation

C. Functional measurements

D. Vocational orientation

E. Evaluation of functional and vocational potential

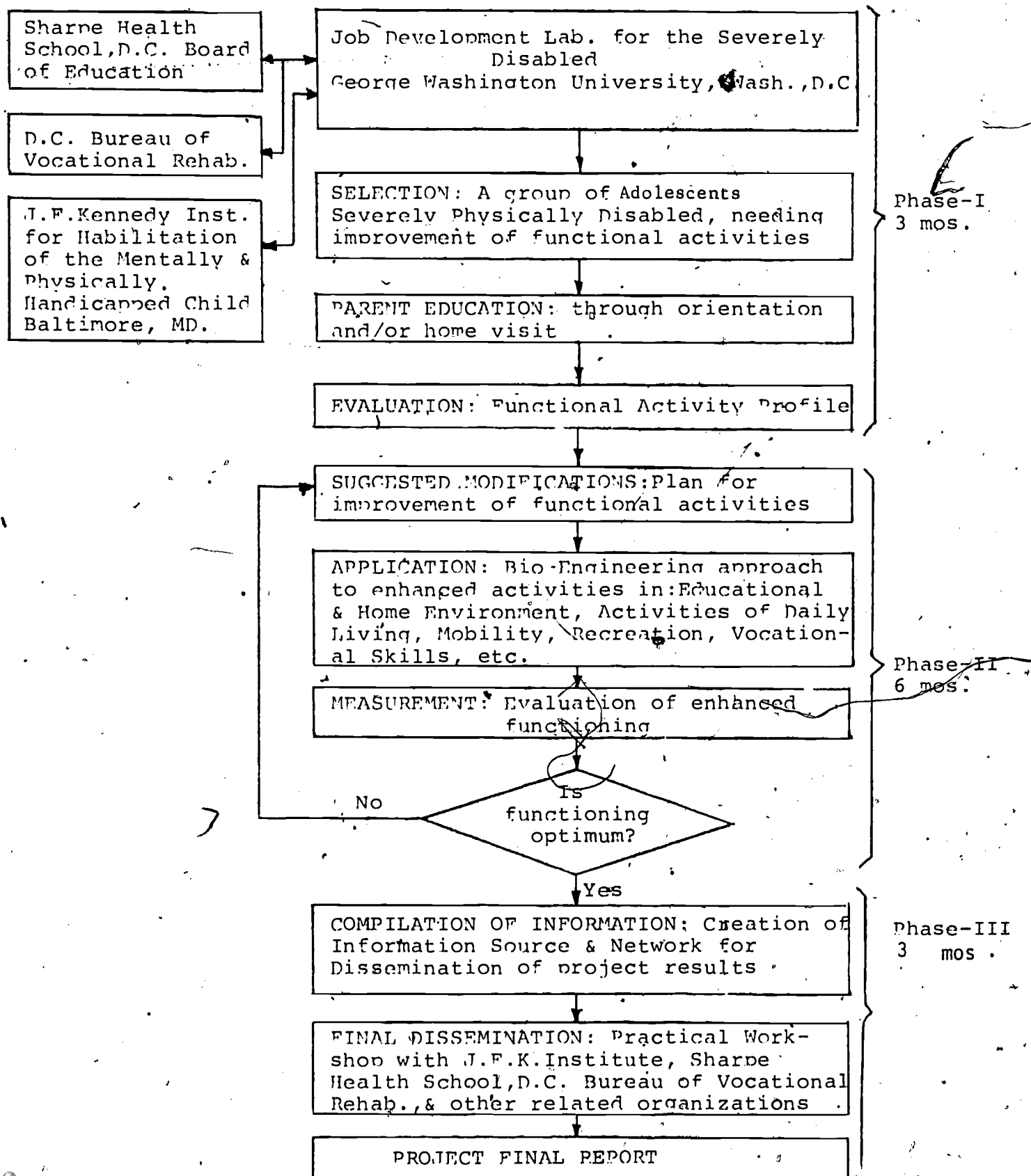
PHASE III. (3 months) Workshop and Final Report and Planning of Regional Workshop

Diagram 1

IMPROVING QUALITY OF LIFE FOR SEVERELY PHYSICALLY DISABLED ADOLESCENTS

Job Development Laboratory

The George Washington University, Med. Center, Wash., D.C.



A. SELECTION OF STUDENTS

With the cooperation of the school staff, twenty-four students of the Sharpe Health School have been chosen to participate in the project. The following selection criteria were applied:

- * Developmental disability with severe physical limitation
- * Environmental modification necessary for students to function independently
- * 9 years minimum age
- * Pre-vocational education level (if applicable)
- * Adequate function necessary for job placement and community integration
- * Minimum ability to follow instructions
- * Ability to decide when assistance is necessary
- * Parental cooperation
- * Stabilized disease process (no anticipation of prolonged hospitalization)
- * Availability of necessary medical information including specific medical characteristics, allergies and precautions.

A general description of the Sharpe Health students chosen to participate in the project is attached. (Appendix A)

B. PARENT EDUCATION

On October 2, 1974, an orientation meeting (Appendix B) was conducted at the Sharpe Health School by the Job Development Laboratory. Staff members from the Sharpe Health School, project students, and parents of 13 of the 24 selected students were in attendance. Such attendance is considered as above average when compared to attendance at past meetings organized and held at the school.

The purpose of this meeting was to promote better parental understanding of the student's potential and to redirect the family's thinking about immediate and future plans as well as long range goals for these students.

By utilizing background materials from earlier research and demonstration projects on the evaluation and training of severely disabled people at The George Washington University, parents were oriented to the concept that a developmentally disabled child can achieve a degree of independence, both economically and physically.

Parents unable to attend this meeting were mailed letters (Appendix C) explaining the project's goals. These letters were followed up by a phone call from a project staff member so that any questions the parents had could be answered and additional information could be provided.

C. INITIAL FUNCTIONAL EVALUATION

Home visits were made by the occupational therapist, the recreation therapist, and the bio-engineer during the initial stage of the project. Social and psychological information was collected during home visits. This was also supplemented by the Sharpe Health School psychologist. A functional activity profile was compiled for each student as a result of these evaluations. The home visit included the following assessments:

1) Occupational Therapist:

Physical characteristics such as hand dominance, strength, range of motion, coordination, spasticity, and pain (Appendix D) were evaluated and,

Functional characteristics such as ambulation, transfer, transportation, method of communication; use of typewriter and telephone were observed.

2) Bio-Engineer:

Where present, existing devices or adaptations were examined and the need for new devices or adaptations was evaluated. Architectural barriers (Appendix E) were evaluated to determine accessibility and degree of mobility; for example, handrails or ramps for stairs, rearrangement of furniture.

3) Recreation Therapist:

An interest questionnaire was developed to evaluate the recreational interests of students of the Sharpe Health School. Students were asked what activities on the list they participated in and to what extent, as well as in which activities they would like to participate. The evaluation included skill level in a variety of recreational activities, knowledge of available recreational activities and individual attitude toward the use of free time (Appendix F).

It was found that the main activities of all the participants at home were watching T.V., listening to the radio, and reading. In addition, most of them participated in school activities which included wheelchair football and basketball, swimming, arts and crafts, and socializing. Most of the students commented that they would enjoy doing more activities at home and community but did not or could not because of architectural/environmental barriers, transportation barriers, family apprehension, unavailability of partners, or inaccessibility of materials.

Based upon the findings of this questionnaire, plans are being made to concentrate on the recreational aspects of the home. The main emphasis will be in providing leisure counseling and recreational activities in the home. A recreational resource questionnaire (Appendix I) will be sent to community recreational facilities in order to compile a resource file to be used, at a later date, in expanding the recreational opportunities of the individuals out into the community.

4) Rehabilitation Counsellor/Psychologist:

The evaluation of social and psychological characteristics included an assessment of educational experience, vocational experience and aspirations, use of free time, and psychological testing in the areas of motivation, intelligence, interests, and aptitudes (Appendix G).

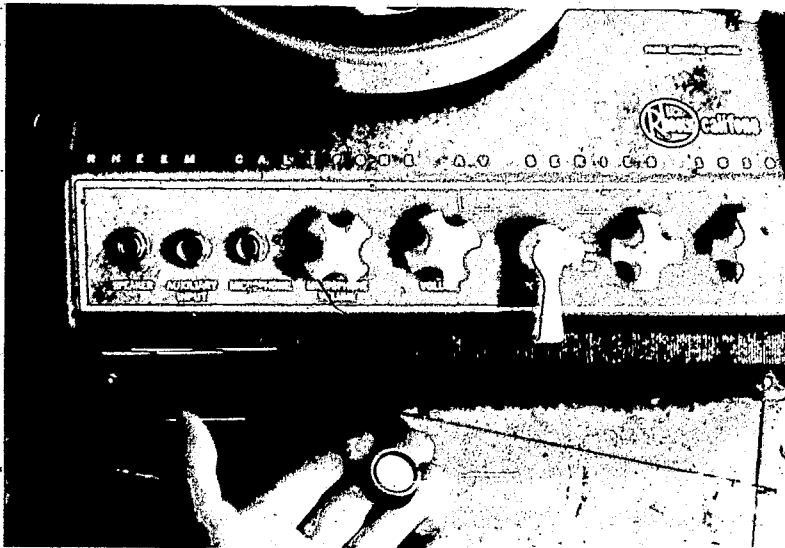
A. UTILIZATION OF ADAPTIVE DEVICES TO INCREASE FUNCTIONAL INDEPENDENCE

Recommendations for environmental modifications and adaptive aids were made by project staff after evaluating the functional activity profiles developed for each student (see Chart 1). A study of commercially available aids, applicable to solving the identified problem, was made. The effectiveness in solving the specific problem relative to its purchase price was assessed to determine cost benefits. If satisfactory commercial aids were not available, new aids were designed and constructed to meet the needs of the individual. Adaptive aids are being utilized to increase the functional independence of students both in the home and/or school setting. Examples of such bio-engineering aids are described below.

1) Designed and Constructed Adaptive Devices

a) Record Player Controls

The record player, available for classroom use, is controlled by a series of cylindrical knobs which are difficult to turn without the conventional grasp and twist. The mode selector was changed from a knob to a lever for greater mechanical advantage. The remaining knobs controlling volume, tone, treble, and bass were changed from the existing cylinders to knobs which afford greater surface area and ease of control without requiring twist and grasp. Some of the students (slow learners) had a tendency to pull the knobs rather than turn them. As the modified controls require only a push to turn them, no grasping surface was required. Therefore, the surfaces were tapered to prevent pulling them.



ADAPTED CONTROLS FOR RECORD PLAYER

Materials: Dow surgical silicone
and polyester resin

Cost of Materials: \$6.00

Chart 1
BIO-ENGINEERING SERVICES TO DEVELOPMENTALLY
DISABLED ADOLESCENTS AT SHARPE HEALTH SCHOOL

ADAPTIVE DEVICES OR MODIFICATION FOR

Client	Age	Grade	Disability	Activities of Daily Living		Environmental Barriers		Leis
				Need	Received	Need	Received	
H.F.	19-3	11	Cerebral Palsy	X	X	X	*	
S.L.	19-11	11	Cerebral Palsy	X	X			
A.G.	17-6	11	Muscular Dystrophy	X	X	X	X	
L.T.	16-5	11	Muscular Dystrophy	X	X	X	*	
H.G.	18-7	12	Muscular Dystrophy	X	X	X	X	
K.S.	18-10	12	Arteriovenous malformation/brain	X	X	X	X	
A.W.	17-6	7	Cerebral Palsy	X	X	X	X	
R.J.	16-7	9	Cerebral Palsy	X	X			
D.M.	18-10	9	Cerebral Palsy	X	*	X	X	
S.M.	17	10	Osteogenesis Imperfecta	X	X	X	*	
E.R.	17-3	9	Osteogenesis Imperfecta					
S.F.	15-4	9	Paraplegia	X	*			
W.D.	19-4	Grad.	Muscular Dystrophy	X	X	X	*	
M.T.	21	Grad.	Muscular Dystrophy	X	X	X	X	
R.T.	19-10	Grad.	Muscular Dystrophy	X	X	X	X	
C.F.	19-4	Grad.	Hoffman's Disease	X	X	X	X	
J.L.	19-11	12	Paraplegia	X	X	X	*	
B.H.	15-7	10	Osteogenesis Imperfecta					
J.L.	18	10	Osteogenesis Imperfecta	X	X			
S.R.	16	9	Osteogenesis Imperfecta	X	*			
D.P.	18-6	8	Cerebral Palsy					
V.R.	17-2	11	Quadriplegia			X	X	
G.R.	12	5	Blind Quadriplegia	X	X	X	X	

* Items needed but not received are presently under construction.

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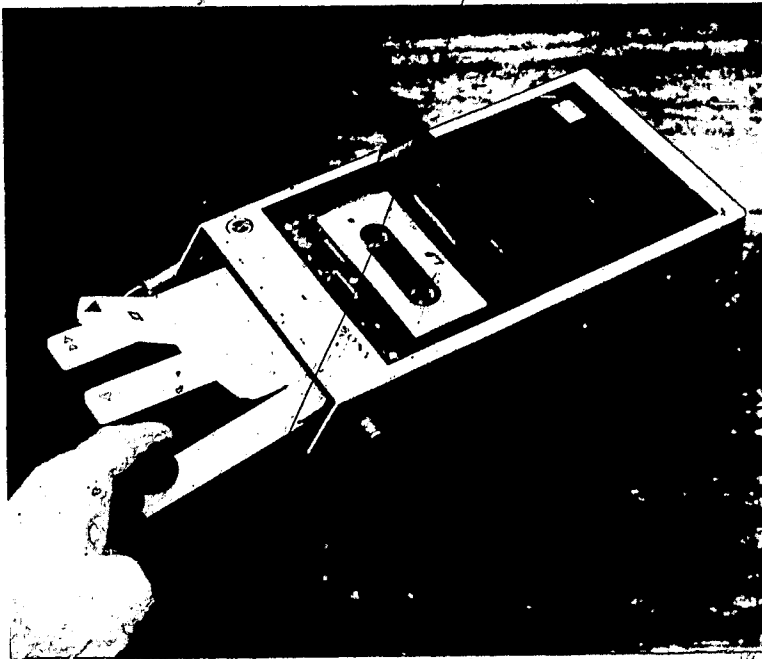
ADAPTIVE DEVICES OR MODIFICATION FOR:

Grade	Disability	Activities of Daily Living		Environmental Barriers		Leisure Time Activities	
		Need	Received	Need	Received	Need	Received
11	Cerebral Palsy	X	X	X	*	X	*
11	Cerebral Palsy	X	X			X	X
11	Muscular Dystrophy	X	X	X	X	X	*
11	Muscular Dystrophy	X	X	X	*	X	*
12	Muscular Dystrophy	X	X	X	X	X	*
12	Arteriovenous malformation/brain	X	X	X	X	X	*
7	Cerebral Palsy	X	X	X	X	X	X
9	Cerebral Palsy	X	X			X	X
9	Cerebral Palsy	X	*	X	X	X	X
10	Osteogenesis Imperfecta	X	X	X	*	X	*
9	Osteogenesis Imperfecta					X	X
9	Paraplegia	X	*			X	X
Grad.	Muscular Dystrophy	X	X	X	*		
Grad.	Muscular Dystrophy	X	X	X	X	X	X
Grad.	Muscular Dystrophy	X	X	X	X	X	X
Grad.	Hoffman's Disease	X	X	X	X		
12	Paraplegia	X	X	X	*		
10	Osteogenesis Imperfecta					X	X
10	Osteogenesis Imperfecta	X	X			X	*
9	Osteogenesis Imperfecta	X	*			X	X
8	Cerebral Palsy					X	X
11	Quadriplegia			X	X	X	X
5	Blind Quadriplegia	X	X	X	X	X	*

but not received are presently under construction.

b) Tape Recorder

The tape recorder switches are arranged in a bank of equal size tabs set close to each other, so that from a tactile standpoint, there is little distinction between them. In addition, the switches were hard to press for students who have coordination problems. Detachable switch surfaces were added which extended from the existing switches at incremental lengths and in a stepped pattern thus adding a slight mechanical advantage to the switch action as well as tactile distinction.



ADAPTED LEVERS FOR TAPE RECORDER

Materials: polypropylene

Cost of Materials: \$1.50

c) Card Reader

The card reader is basically a tape recorder which records and plays back via a strip of magnetic tape along the lower edge of the card. Along the upper edge of the card is a sentence and an illustration corresponding to the thought of the sentence. The student feeds the card into the machine and reads the sentence which is recorded. He then reinserts the card to listen to the sentence.

The problem in this case stemmed from the fact that where the card is ejected, it falls to the floor before the student can grasp it. A pair of clear acetate leaves which grasp the card without restricting its passage through the recorder were added so that the student can easily pull the card from the leaves.

A minimal acetate thickness was used so that students with coordination problems could not damage the leaves or injure themselves on a less flexible protrusion.

(see continuation, next page)



ADAPTED CARD STABILIZER FOR CARD READER

Materials: acetate leaves
Cost of Materials: \$.50

d) Modifications for R.T. and M.T. in institutional setting

R.T. and M.T. have muscular dystrophy and are confined to electric wheelchairs at the Home for Incurables. This environment presents basic everyday problems to their lifestyle, particularly their hobbies, cartoon illustration, and popular music. They spend as much time as possible drawing, painting, and sketching, and when the art room is closed or they become too tired, they take advantage of their extensive record collection.

Since the activity room is not always available and creativity does not always fit an institutional schedule, the objective was to provide facilities in the clients' own room. We, therefore, designed a table similar to the one in the art room, providing easier wheelchair access, space for game drawers to be added later, and a shape more suited to their particular space requirements. We also constructed a special holder for pens and pencils as picking up drawing tools from the table is a problem for M.T.

These clients have a hi-fi arrangement which consists of one speaker and two separate amplifiers for phonograph and radio. To allow them to operate these without constant switching of speaker plugs and power supplies, both amplifiers were wired to the speaker through an audio mixer, and both power cords plugged into an outlet extension, thus allowing them to change from radio to phono without additional switching.

R.T. and M.T. also had no means of turning their television on and off for evening entertainment, or for calling nurses if the need arose. Remote touch switches (requiring only 1/2 lb. of force to operate) were wired to give them these capabilities.

Finally, since the bathroom mirror was too high for the wheelchair bound, a lower mirror was supplied.

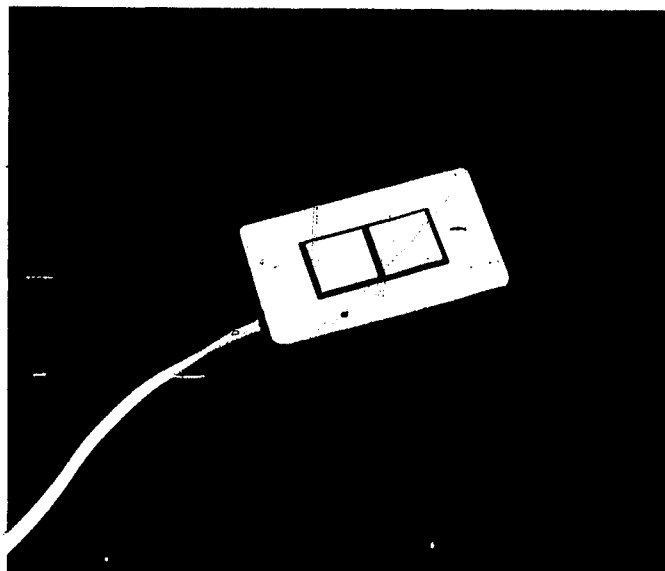
These changes in environment make it easier for M.T. and R.T. to enjoy the activities and fulfill the necessities which are most important to them.

(continued)



ADAPTED TABLE

Materials: wood, Formica top,
contact cement,
polyurethane
Cost of materials: \$30.00



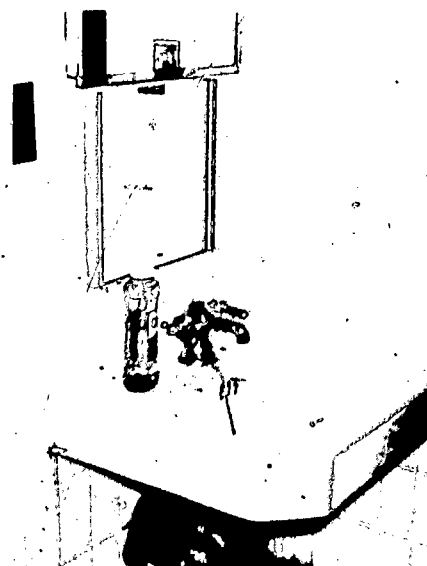
ADAPTED SWITCH

Materials: Leviton AC single pole
quiet switch
Cost of materials: \$3.99
Supplier: hardware store



PEN AND PENCIL HOLDER

Materials: wood, contact cement,
high density polyethylene
Cost of materials: \$1.00



LOWERED MIRROR

Materials: wood, mirror
Cost of materials: \$1.50

e) "Get-Up Box" and Ramp

H.G. has developed a routine using a pedestal for getting out of bed in the morning. The objective was to construct a pedestal as exactly to his specifications as possible. A finished wooden box of 7" x 6" x 9 1/2" dimensions was built with a vinyl-covered foam cushion on top for added comfort. With this device, he is able to transfer himself from his bed to his wheelchair independently.

Both H. and A. need assistance in entering and leaving their home due to the front steps and sidewalk configuration. An all-weather wooden ramp was designed to make it possible for them to drive their wheelchairs from the sidewalk directly into their home without assistance.



"GET-UP BOX"

Materials: wood, polypropylene
Cost of materials: \$3.00



RAMP

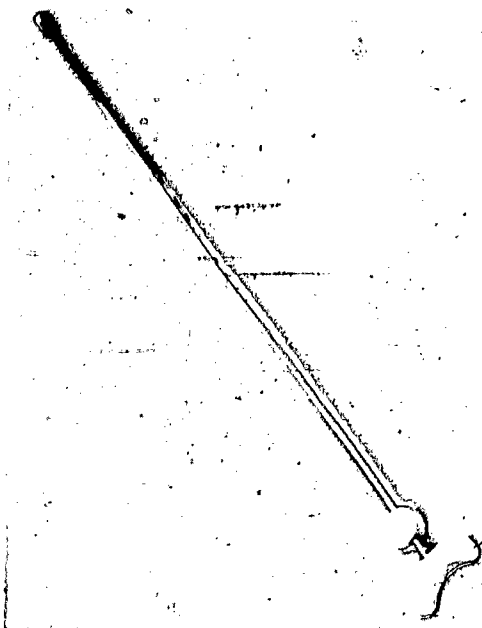
Materials: wood, stair tread
vinyl
Cost of materials: \$25.00

f) V. R.'s Mouthstick and Straw

The layout of V.R.'s bedroom necessitated the location of his stereo system well out of his reach from his electric wheelchair. A mouthstick would easily solve this problem, as the controls are particularly easy to operate. However, the length required was approximately 24", well beyond the reach of the average mouthstick. The added length presented a problem of weight and stability which was solved by the design of a new mouthpiece.

The mouthpiece was molded of surgical silicone rubber in two pieces. One piece was fixed to the end of the stick, to be grasped by the molars, the other slides along the stick to fit the location of the front teeth. This design provides gripping surface for both sets of molars and the front teeth. This three-point grip gives greater stability and control needed for manipulation of the mouthstick.

V.R. has a large water pitcher at his bedside which he uses rather than a drinking glass. He needed a long straw to use this pitcher, one was formed from acrylic tube in the desired length and configuration



LIGHT WEIGHT 24" MOUTHSTICK

Materials: Dow surgical silicone
aluminum rod

Cost of materials: \$2.00



ADAPTED PLEXIGLAS STRAW

Materials: Plexiglas straw

Cost of materials: \$.15

g) A.W.'s Chair

A.W.'s apartment, its doorways, hallways, etc. prohibit easy mobility in a wheelchair. Consequently, she was forced to find other ways to move about for the short distances required. She used a wooden chair to "scoot" from room to room, but this became as hard on the chair as it was on the floor.

An existing castered secretary's chair was modified by lowering it so that her feet would touch the floor, thus giving her the same mobility with greater ease.



LOWERED, WHEELED SECRETARY'S CHAIR
FOR MOBILITY

Materials: wheeled, secretary's chair

Cost: This chair was donated to the project.
A similar chair can be purchased second
hand for about \$5.00 - \$10.00

h) J.L. and D.M.'s Contour Seats

1) J.L.'s Contour Seat:

Chief Complaint: Inability to maintain adequate sitting position in automobile and therefore unable to receive driver's training.

Prescription: Contoured seat (portable - to be used both in and out of automobile and in regular chair).

Fabrication procedure:

- a) A large plastic bag filled with 1/8" styrofoam beads was placed in wooden chair form and connected to vacuum system.
- b) Client was placed in bag in optimal sitting position. Bead-filled bag was positioned around her to fill in contours of her anatomy.
- c) Air was evacuated via vacuum system.
- d) Client was removed from bag leaving rigid impression as vacuum was maintained.
- e) Hollow impression was filled with plaster and allowed to harden after which it was removed and modified.
- f) Vacuum forming procedure using 3/8" polypropylene was used over plaster mold.
- g) Polypropylene shell was mounted in rigid foam and finished with coat of polyester resin.

Result: Client able to use seat in automobile enabling her to receive driver's training. This seat can also be used in any regular chair and will provide a more functional sitting position. Utilization of this chair in typing class allows her to sit whereas, before, she was standing to type.



J.L.'s CONTOUR SEAT

Materials: polypropylene, polyurethane foam,
nylon reenforced polyester resin

Cost of materials: \$70.00

2) D.M.'s Contour Seat:

Chief Complaint: Poor sitting posture in wheelchair necessitating use of numerous straps to keep client in chair.

Prescription: Contoured seat for wheelchair.

Fabrication procedure: same as for J.L.'s contour seat

Result: After secondary modifications were made to contoured seat, client is able to sit in a more upright, more functional position. Straps are still necessary and maximal tolerance has not yet been gained but the advantage of more functional sitting position is present. Several functional activities were impeded as a result of use of this seat.

- a) Client was unable to urinate in the manner previously used, necessitating the client to be transferred from chair, thus cutting down on the amount of time client could remain in chair.

Solution: A female urinal was ordered and client taught to use it while sitting. Appropriate structural adjustments were made to the contour seat.

- b) Client was unable to remove slacks or to pull them down to urinate.

Solution: Slacks were adapted by use of a zipper with a large ring. Client was taught a method to pull slacks down and a way to put them on.

- c) Client was unable to transfer using method previously learned.

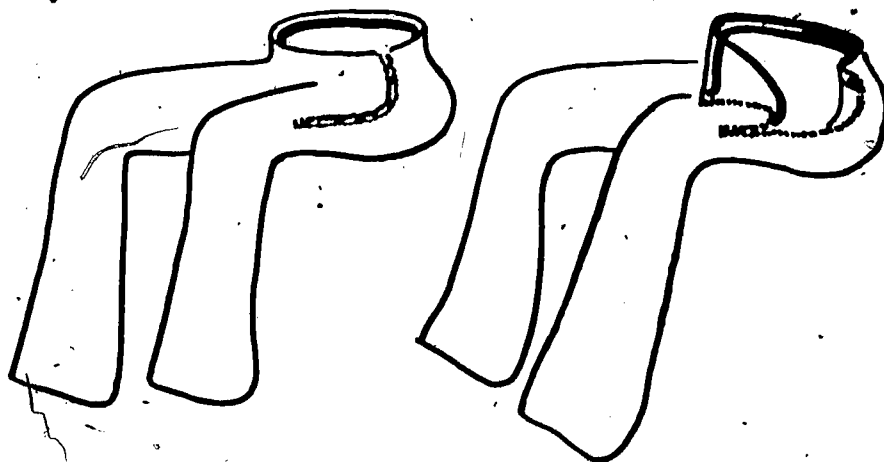
Solution: Client was taught a new method for transfer.



D.M.'s CONTOUR SEAT

Materials: polypropylene, polyurethane foam, Cost of materials: \$70.00
 nylon reenforced polyester resin

ADAPTED PANTS



Pants have
 12" seam

The right hand seam of the pants was opened about 12-15". A jacket type nylon zipper with ring was inserted. Pants could then be unzipped and the front pulled over to the side allowing urinal to be inserted while client sits. Knit pants are preferable as they have more "give" than other fabrics..

i) S.L.'s Hand Orthosis and Drinking Glass

1) S.L.'s Hand Orthosis

Chief Complaint: Decreased function of dominant upper extremity due to athetosis.

Prescription: Long opponens orthosis with C-bar

Fabrication procedure:

- 1) Client was casted with wrist in neutral position with thumb opposing digits.
- 2) Plaster mold was made and modified.
- 3) Orthosis cut and formed to mold using nyloplex.

Result: Orthosis provides a degree of stability at wrist by preventing acute flexion. Thumb is held in opposition. Whether or not function has been increased is questionable.

2) S.L.'s Drinking Glass

The spasticity of S.L.'s arms made it impossible for him to hold a conventional drinking glass without considerable spillage.

A 16 oz. high-impact styrene drinking glass was purchased to which a polypropylene loop handle was attached. This allows S.L. to hold the glass by simply inserting his hand into the loop. The large capacity of the glass allows it to hold a considerable amount of liquid even though it is only half filled to avoid overflow and spillage due to spastic movements.



HAND ORTHOSIS

Materials: Nyloplex, velcro
Cost of materials and labor: \$100.00



DRINKING GLASS

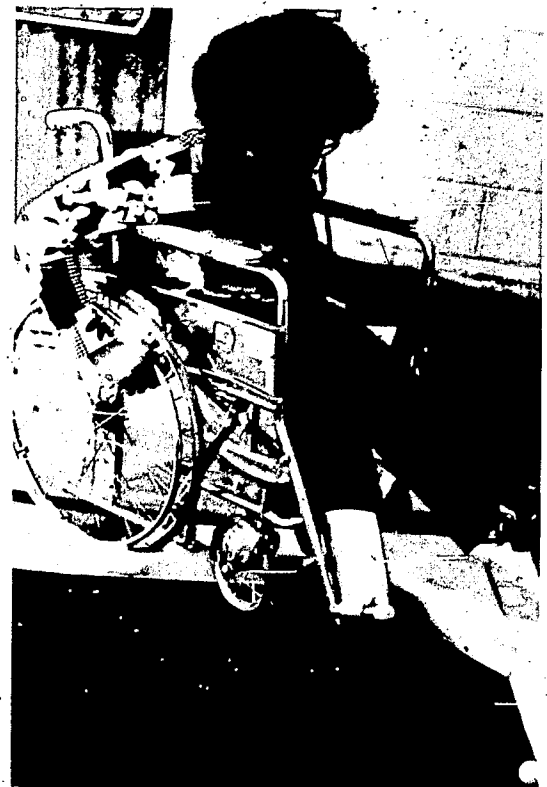
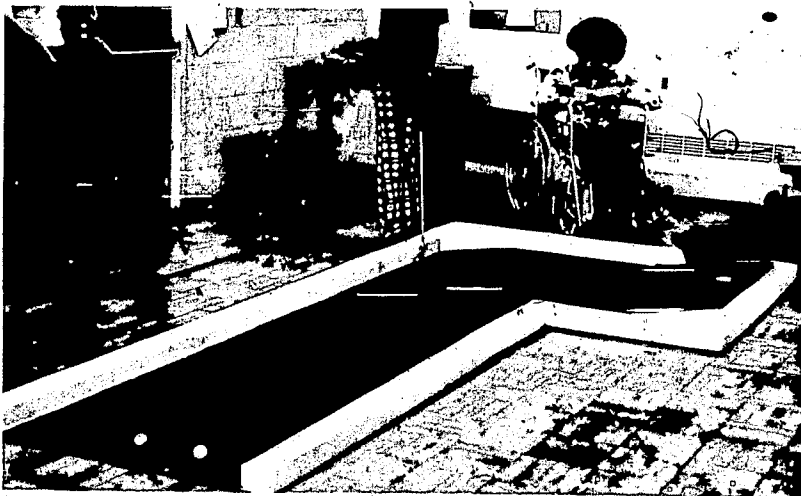
Materials: Styrene drinking glass,
polypropylene handle
Cost of materials: \$1.10

j) Portable Miniature Golf Course

Most public miniature golf courses are models of inaccessibility for the handicapped. Barriers which keep the golf balls on the course serve to keep wheelchair players off, and most of the clever, colorful obstacles are more than obstacles to the disabled.

With these problems in mind, a miniature golf course was conceived utilizing high-density foam barriers and obstacles which would provide no hindrance to the disabled player. The actual hole was set into a movable base to allow relocation of the "green" for greater versatility of play. With this one piece removed, the course may be rolled up like a rug for easy storage (see diagram on next page for exact specifications).

Conventional colored golf balls and a conventional putter are being used at present.



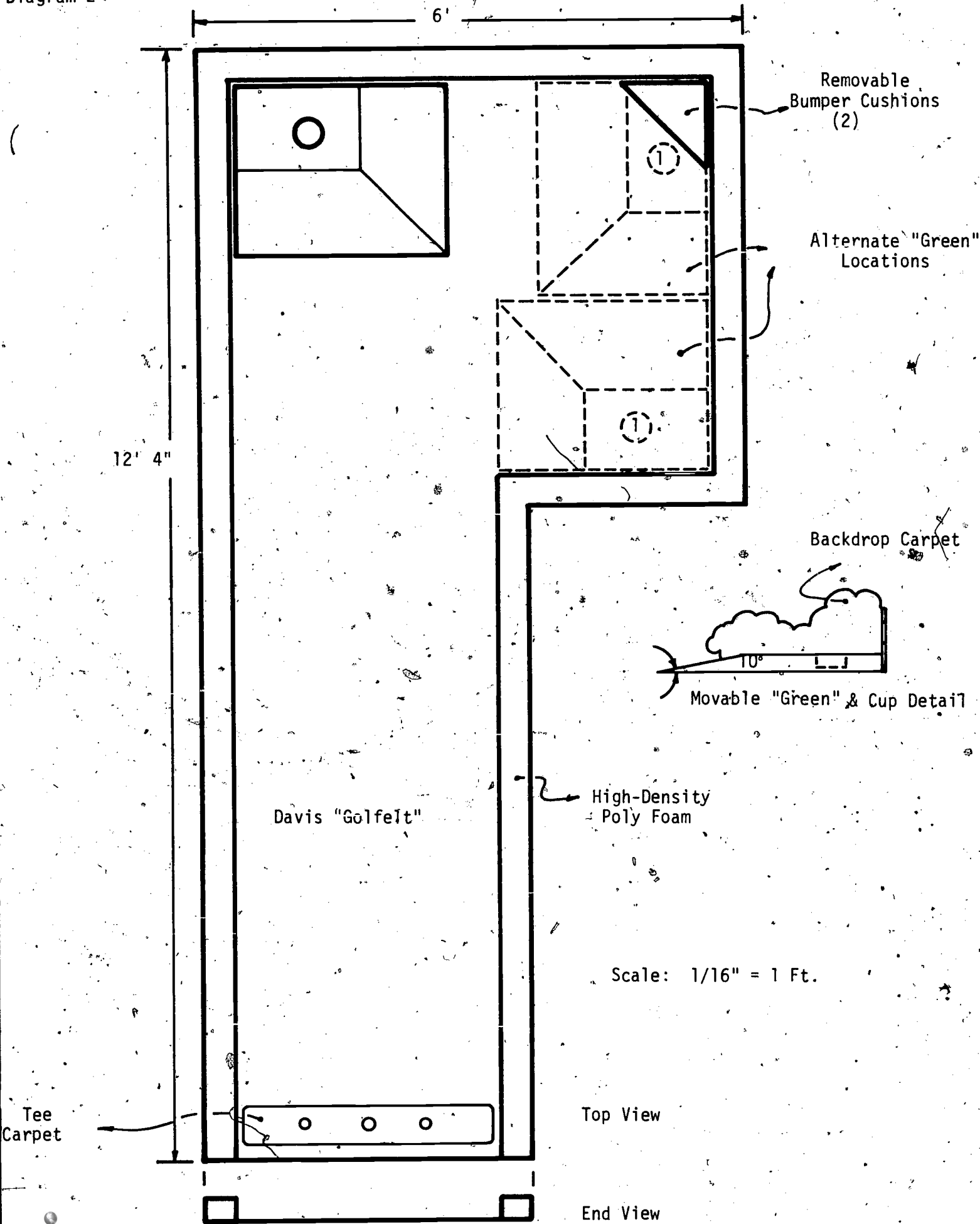
MINIATURE GOLF COURSE

Materials: Davis Evergreen, Golfelt, high-density polyethylene foam, contact cement, wood (for "green" assembly)

Cost of materials: \$51.20

Diagram 2.

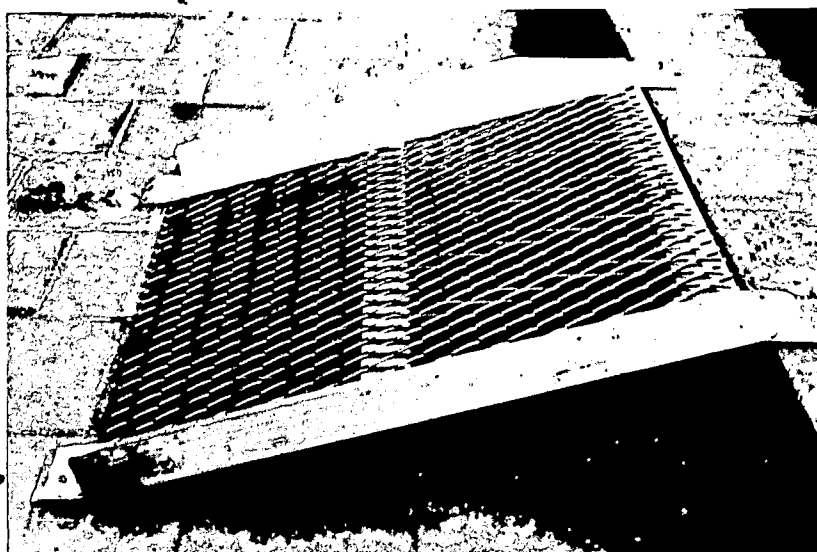
SPECIFICATIONS FOR 1ST UNIT OF GOLF COURSE



k) C.F.'s Wheelchair Ramp

Two steps outside C.F.'s apartment, coupled with the considerable combined weight of C.F. (210 lbs.) and his electric wheelchair (160 lbs.) had caused structural damage to the wheelchair frame on his way to and from his daily work.

As the steps are on public land and heavily used by pedestrian traffic, a permanent ramp was unfeasible. Therefore, two aluminum ramps were designed for the steps as a compromise between portability and ease of use; i.e., ramp angle. Because C.F.'s driver helps him into his house, the power of his wheelchair and the driver's strength allowed a more severe ramp angle than generally recommended and, therefore, greater portability.



WHEELCHAIR RAMP.

Materials: 4" structural aluminum
U-channel, webbed iron
mesh

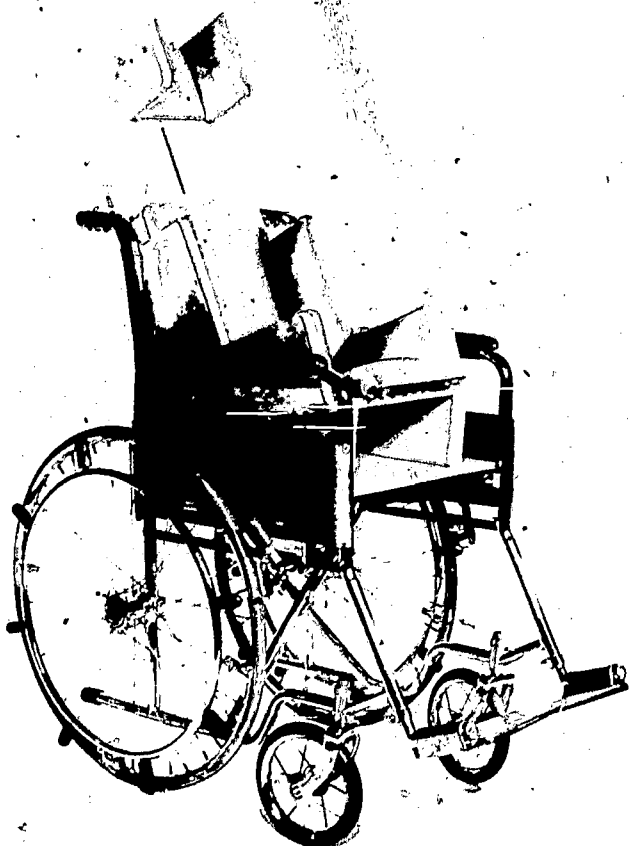
Cost of materials: \$33.00

1) L.B.'s Wheelchair Support-Seat

L.B., a profoundly retarded, physically handicapped student, had no trunk or neck control to support herself in a sitting position in her standard wheelchair.

Critical body measurements were used to fabricate a semi-reclining wheelchair seat with lateral trunk support and adjustable head support.

The upholstery was done with heavy duty vinyl mounted on detachable cushions for easy cleaning and subsequent adjustment.



L.B.'s WHEELCHAIR SUPPORT-SEAT

Materials: vinyl, 3/4" particle board,
hardware, paint, high-density
foam, miscellaneous wood

Cost of materials: \$18.00

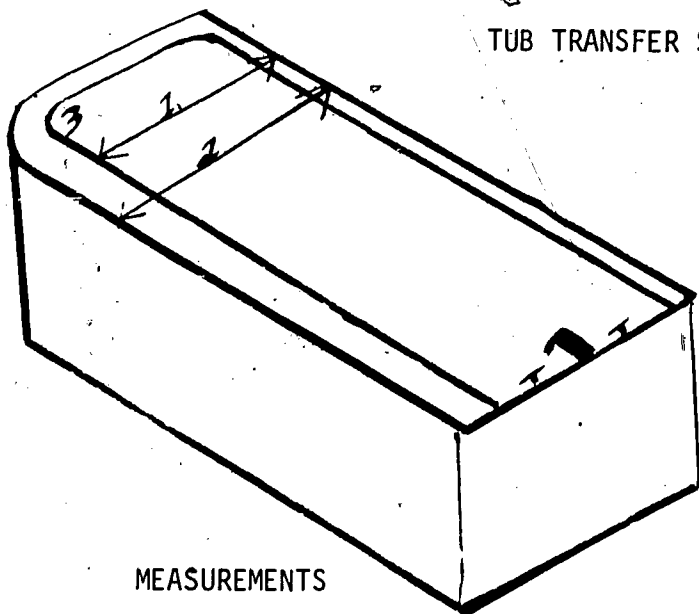
m) J. L.'s Tub Transfer Seat

J.L. had much difficulty getting down into the bathtub due to paraplegia. The method he used was unsafe. To prevent falls and to allow complete independence in taking a shower, the tub transfer seat was made.

This tub seat is very stable when wedged between the tub and wall and resting on the two rims of the tub. It allows persons with paraplegia, arthritis, cerebral palsy, cerebral vascular accident, or any disorder that requires sitting while bathing to take a sponge bath or shower without having to get down into the tub.

The procedure he used with this transfer seat is to sit on the seat with legs outside the tub, lift legs into the tub one at a time, slide to the center of the seat, and reach forward to operate the faucets.

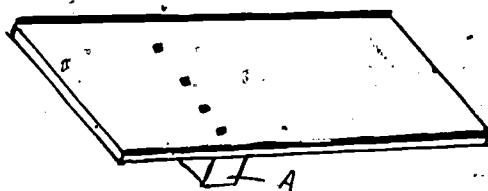
TUB TRANSFER SEAT



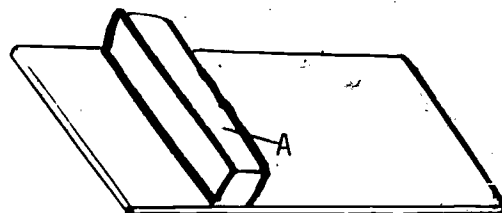
MEASUREMENTS

1. From wall to outer rim
2. From wall to inner rim
3. Allow for curve if seat is to fit against wall at back of tub

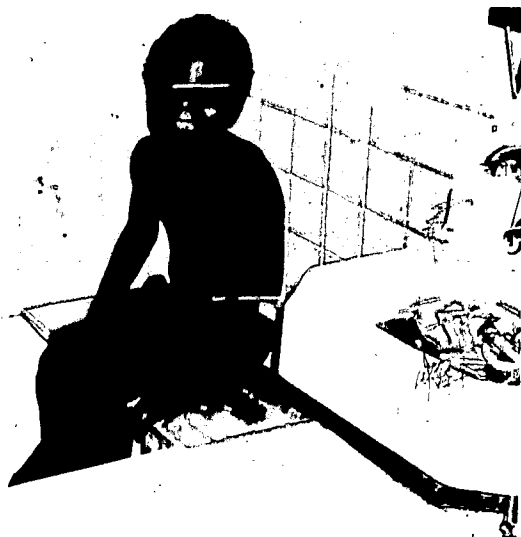
TOP VIEW



A - WEDGE TO PROVIDE STABILITY



BOTTOM VIEW



Materials: seasoned wood (11" wide, 3/4" thickness, 2" x 2" wedge), polyurethane (three coats)
Cost of materials: \$2.00

Tub Transfer Seat Design
Credit: Gloria Furst, OTR

2) Commercially Available Adaptive Devices

The adaptive devices for "dressing", "hygiene", "transfer", "eating", "accessibility", and "reacher" as listed in this section are available from the following suppliers:

- The Hill Rom Store
4916 Fairmont Avenue
Bethesda, Md. 20014
Phone: (301) 986-1031
- The BK numbers are from:
Be OK Self-Help Aids
Fred Sammons, Inc.
Box 32
Brookfield, Ill. 60513
Phone: (312) 246-3216
- Invacare
1200 Taylor Street
Elyria, Ohio 44035
(216) 365-9321
- J.A. Preston Corporation
71 Fifth Avenue
New York, N.Y. 10003
Phone: (212) 255-8484.
- Lumex, Inc.
Bayshore, New York
Phone: (516) 273-2200

ADAPTIVE DEVICES

DRESSING



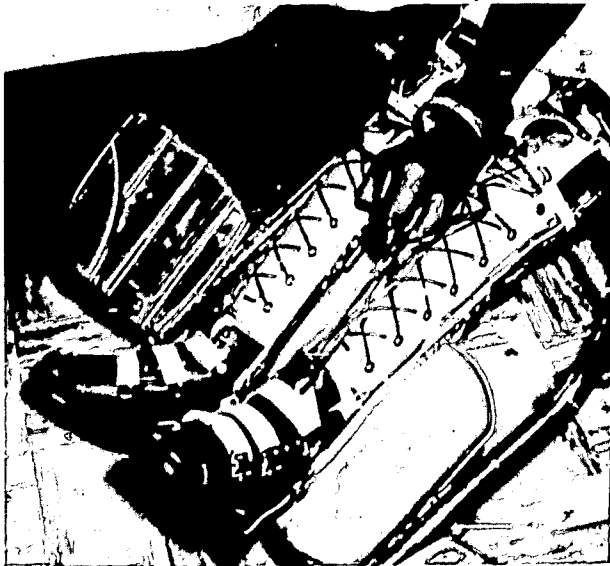
a) VELCRO CLOSURE

Velcro is a pressure sensitive hook and loop tape which can be used as closures for those who cannot manage buttons, hooks, or zippers due to loss of sensation, lack of strength or poor coordination. Various colors.
BK 7578-01-01, Velcro Hook-1": \$1.46
BK 7579-01-01, Velcro Loop-1": 1.46
One Yard.



b) LEG STRAP

Strap with velcro closure which fits around the leg and edge of the wheelchair to prevent legs from rubbing against each other.
Cost: under \$1.00



c) VELCRO CLOSURE FOR SHOES

Before velcro closure was added, client was unable to fasten her shoes due to limited reach. Velcro is used with D rings.
Cost: about \$1.50 for materials



d) VELCRO CLOSURE FOR PANTS

Before Velcro closure was added, client was unable to fasten his pants at the waist band.
50¢ to \$1.00 per pair of pants.

ADAPTIVE DEVICES

DRESSING



e) SOCK DEVICE

Used for those clients who are unable to bend down far enough to slip sock over foot. Sock is placed around a long U-shaped cone with straps. Client holds the straps, drops cone and sock to foot level, inserts toes into opening, then pulls the straps bringing sock over foot and cone slips out. Can be made using X-ray film, leather, or polystyrene sheeting and webbing for about \$1.00. The commercial device may be too rigid for some clients.

BK-2086 Flexible Sock Aid \$6.00



g) ELASTIC SHOE LACES

Elastic shoe laces are tied in conventional manner and remain tied while foot is slipped in and out of shoe. "Tylastic" is heavy duty and preferable to "Flex-o-lace."

-6066 Tylastic Shoe laces=90¢.



f) SOCK DEVICE

Commercial sock device at left was used to pull sock over toe and foot but would not go over heel. Student uses this dowel stick with cup hook to pull sock over heel.

Custom Made Cost: \$.50



h) COMB ADAPTATION

Comb was rivited to a strip of polypropylene plastic for an extended handle which was heated with a heat gun and bent to a functional contour.

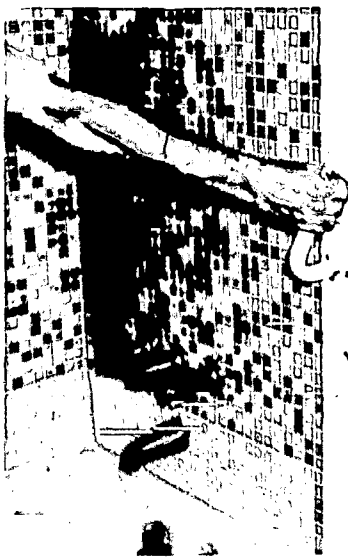
Cost: about \$1.00

ASSISTIVE DEVICES

HYGIENE



a) BATH TUB SAFETY STRIPS
Safety strips were placed in the tub to prevent falls or slipping during transfers. The client, however, found them abrasive and they were removed. A rubber suction cup bath mat is preferable. Safe X-Safety treads: \$1.95



b) GRAB BAR FOR BATH
This sturdy metal grab bar was installed using mollys to assure safety in tub transfers for an Ataxic client.
Lumex Grab bar: 12" #4003: \$6.70



c) LONG HANDLED BATH SPONGE
Used to reach back and lower extremities for bathing independence. Can be bent with a heat gun for better contour.
BK-6298 Long Scrub Sponge: \$1.35

ASSISTIVE DEVICES

TRANSFERS



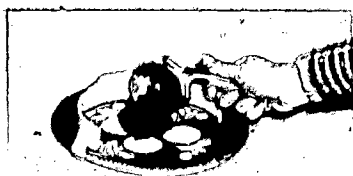
TRANSFER BOARD

This client was unable to transfer by himself. With this light weight plastic transfer board he is able to transfer independently to and from the wheelchair, car, bath tub, and car.

Invacare: \$22.00

ASSISTIVE DEVICES

EATING



a) ROLLING KNIFE

Pizza cutter knife used for cutting meat by a one handed client or one with poor coordination.

BK-1398-One Hand Roller Knife=\$1.75

b) PLATE GUARD

Used with an athetoid cerebral Palsy student to assist in getting food onto his spoon.

BK-1478 Plastic Food Guard - \$3.75



c) UNIVERSAL CUFF

A band that fits around the hand with a Velcro closure used for those with weak grasp to hold eating utensils or tooth brush.

BK-1054-Comfort Utensil Holder-medium
d) \$1.40 each

SUCTION CUP PLATE HOLDER

Suction cups are on both sides-used to stabilize the plate for an athetoid cerebral palsy client.

BK-1259-Little Octopus Suction Holder
\$1.48 each

ADAPTIVE DEVICES ACCESSIBILITY



a) LOWERED TELEPHONE

This telephone is too high for this muscular dystrophy client to reach and he is unable to replace the receiver. It should be lowered for better convenience.



b) TOT-O-MATIC LIGHT SWITCH

This device enables a person with limited reach to turn the lights on and off. It is no longer available commercially and must be custom made. Materials about \$1.50.



c) DOOR KNOB EXTENSION

Used with clients with limited grasp or who lack supination and pronation. It snaps over the door knob and gives leverage to turn the knob.
BK-6393 Door Knob Extension:\$1.25



d) JAR OPENER

To assist a client with weak grasp to open jars.
BK-3086 Zim Jar Lid Opener
\$3.40

ASSISTIVE DEVICES

REACHERS



a) PLEXIGLAS REACHER

Lightest weight reacher - used for muscular dystrophy clients who lack strength to lift conventional reacher. The end of a plexiglas straw is heated with a heat gun and a hook is inserted. Made with following materials:
BK-1133 Flexible Plastic Straw (10) \$1.32
Hooks - package of 6 .49
\$1.71



b) DOWEL STICK REACHER

Dowel stick with cup hook in one end and closet hook in other end, used especially to remove clothes from the closet for those with limited reach or for the wheelchair bound.
Cost to make about 60¢
BK-2109 Economy Reacher & Dressing Stick - \$1.50



c) METAL BAR-B-QUE TONGS

Used to extend reach and grasp. The Fairgrove brand has serrated edges which are preferable to rounded edges. Gadget section in Housewares of department stores.
Fairgrove - Manufacturer - \$1.24



d) WOODEN REACHER

27" scissor-type reacher with magnet. This reacher may be too heavy for some with loss of strength and is best used with two hands - can be used with one hand.
BK-6105= Better Grip Wooden Reacher= \$6.98

ASSISTIVE DEVICES

REACHERS



e) PISTOL TYPE REACHER

27" aluminum, 7 oz. one handed pistol trigger action reacher with jaws that open about 2". It has a magnet and a projection for pulling things.

BK-6109 Helping Hand Reacher

\$16.00



f) GRAB ALL REACHER

30" metal reacher with wide jaws, best for large objects (cans, cereals, etc.). Can be used one handed but requires normal grasp.

BK-6438 - Grab All Reacher=\$5.75.

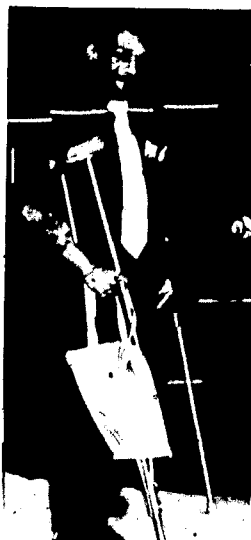
ASSISTIVE DEVICES TRANSPORTING OBJECTS



a) WHEELCHAIR CADDIE

Plastic box attached to wheelchair to carry objects and drinks. Interferes with manipulation of wheelchair, easily broken.

Everest & Jennings:
\$9.95



b) CRUTCH BAG

Canvas bag attached to crutch by webbing straps. Opens to 3" thickness. Allows person to carry books and other objects.

Preston: PC-7378
Utility Crutch Bag: \$8.30



c) SHOULDER BAG

Used to carry items by those clients who use crutches.

Levi: \$6.00

Others: \$3.00 and up.

B. RECREATION

Student interests along with the therapeutic value of recreational activities were considered in selecting the following recreational programs (Items 1 through 4) for implementation at the Sharp Health School.

1) After-School Music Program

Ten students participated in an after-school music program that met for one hour each week. The major components of this program included: learning how to read music, instruction in playing musical and rhythm instruments, singing, and music appreciation. The weekly lesson plans that were used are listed in Appendix H.

The recreation therapist and a music therapist (working as a consultant) evaluated the students in the areas of physical functions, motivation, socialization, education, and recreation. The components of each of the five major areas evaluated are as follows:

Physical Functions

- a) Develop basic movement of walking
- b) Coordinating and rhythmically using parts of the body to strong rhythm beats
- c) Grasping and handling of rhythm instruments with controlled use of fingers, hands, wrist, and arms
- d) Maintaining the use of line motor coordination by transferring them to more difficult instruments demanding additional control; i.e., piano, guitar, and coronet

Motivation

- a) Attendance at the after-school music program
- b) Improvement and increase of attention span
- c) Participation at a group level--playing rhythm instruments with the group when the music begins and stopping when the music stops
- d) Participation at an individual level; assisting in mechanics of music program to help maintain smoothness and efficiency
- e) Taking the initiative in leading others in chorus and rhythm band
- f) Showing initiative in helping plan and implement the music program
- g) Persistence in practicing and learning songs for performance

Socialization

- a) Group interaction among students
- b) Social interaction between students and staff

Educational

- a) Learning how to read music and transferring this knowledge to more complex instruments; i.e., guitar, piano, coronet, recorder

- b) Understanding the concept of rhythm and transferring concept to instrument
- c) Improving comprehension of instruction
- d) Learning the history and usage of rhythm instruments
- e) Giving creative interpretations of recorded music
- f) Recognizing different concepts of music; i.e., rhythm melody, harmony, tempo, dynamics, and forms
- g) Ability to play music by ear
- h) Learning to play or sing a song from memory
- i) Music appreciation of different styles of music

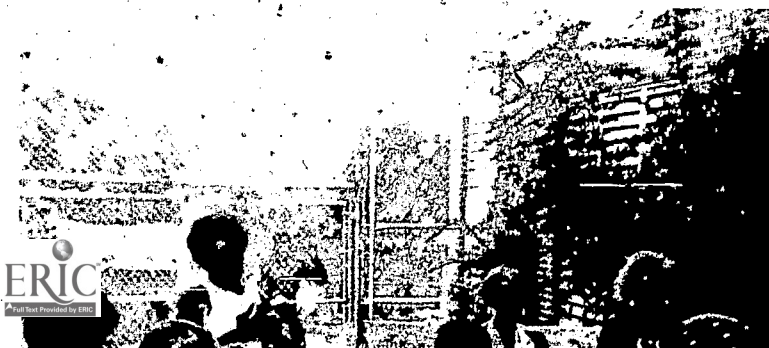
Recreation

- a) Relaxation during program
- b) Enjoyment, pleasure, and fun of listening to music
- c) Providing an outlet and opportunity for release of emotions
- d) Enjoyment of singing
- e) Enjoyment of playing and making one's own music--improvisation
- f) Satisfaction of performing music for others

An evaluation on each student was done weekly by the music consultant and the recreational therapist. The students were rated on a scale from 1-5 with 5 being excellent, 4-good, 3-average, 2-fair, and 1-poor.

Emphasis was placed on different specific goals for each student. The ratings each student receiving each week in a major area were determined by taking the average of the ratings given to the student in the specific goals of the major area that the student worked on for that session.

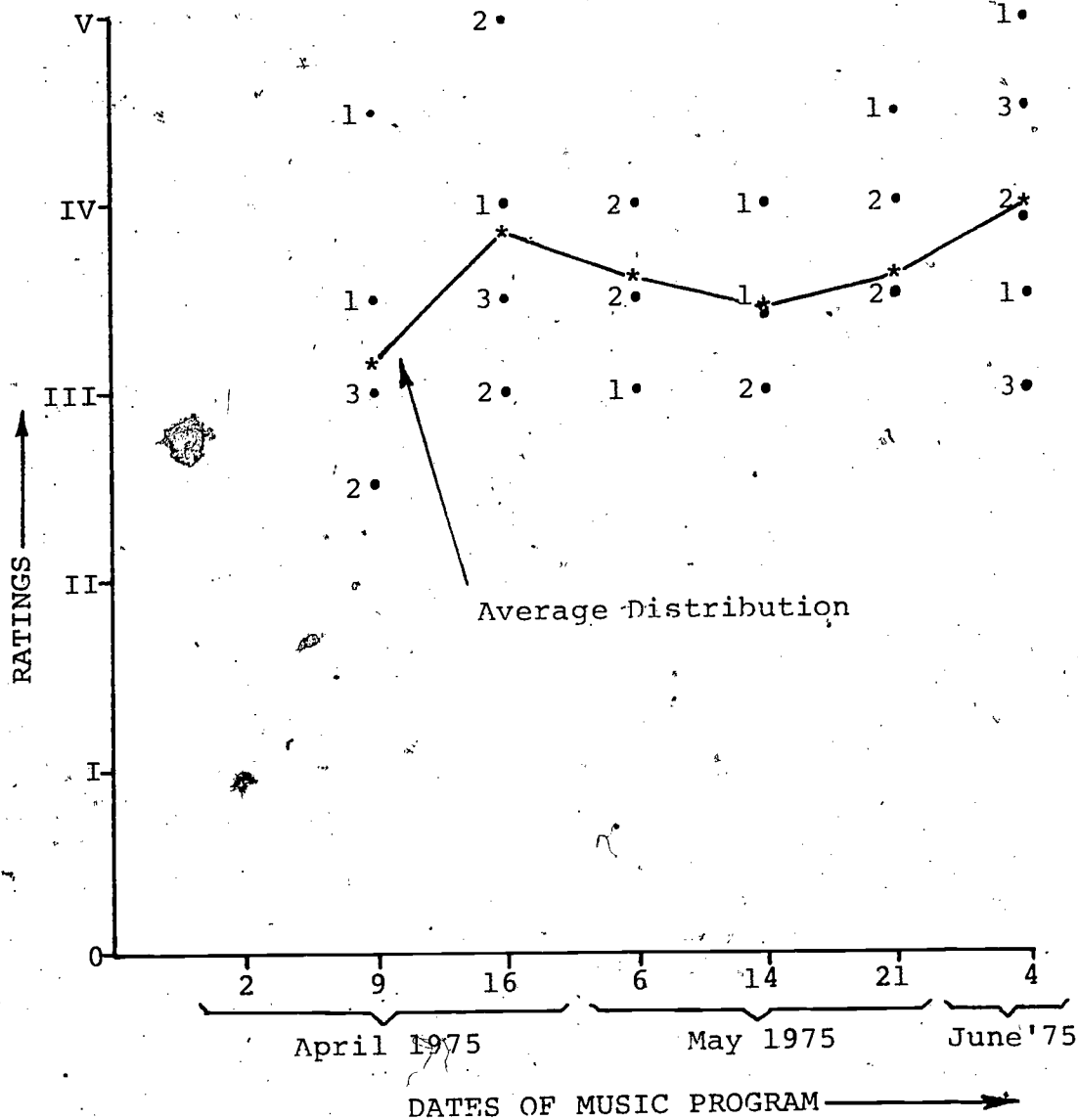
The following graphs represent the increase in performance of the 10 students over the seven week period that the program was operational.



PHYSICAL FUNCTION PROGRESS RATINGS GRAPHED BY NUMBERS OF STUDENTS
IN ATTENDANCE ON EACH DATE THAT MUSIC PROGRAM WAS IN SESSION

Ratings

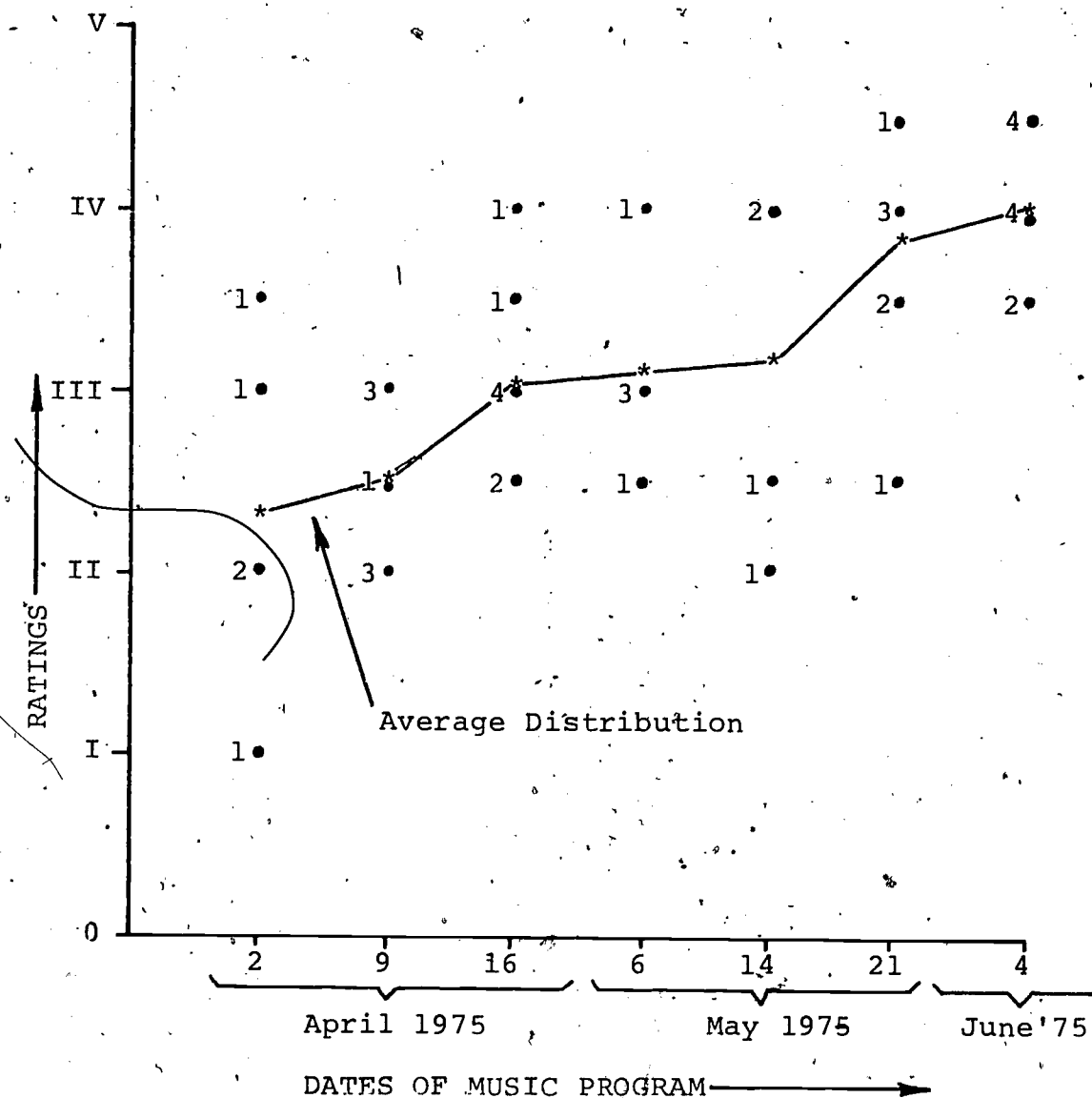
V=Excellent
IV=Good
III=Average
II=Fair
I=Poor



MOTIVATION PROGRESS RATINGS GRAPHED BY NUMBERS OF STUDENTS
IN ATTENDANCE ON EACH DATE THAT MUSIC PROGRAM WAS IN SESSION

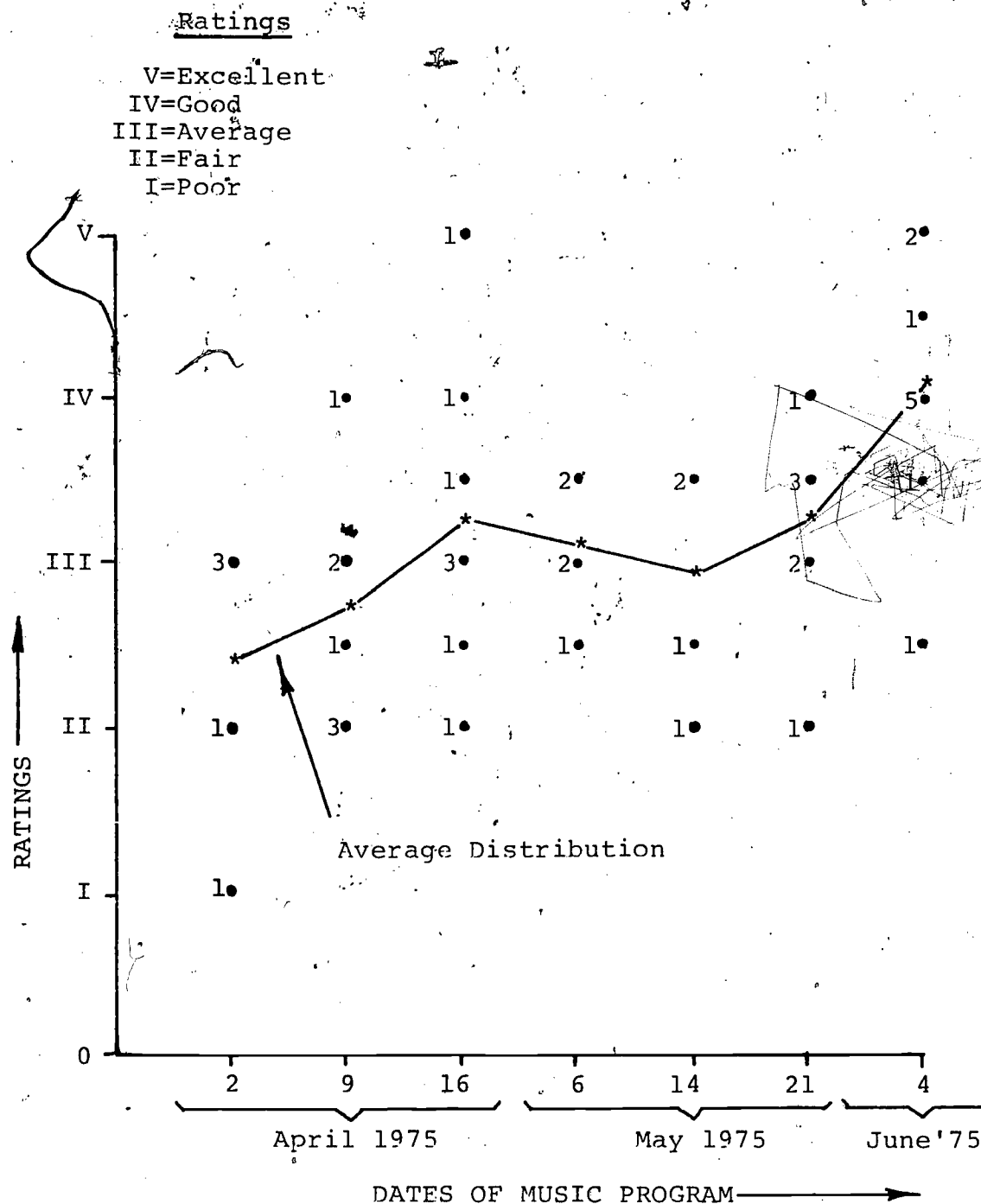
Ratings

V=Excellent
IV=Good
III=Average
II=Fair
I=Poor

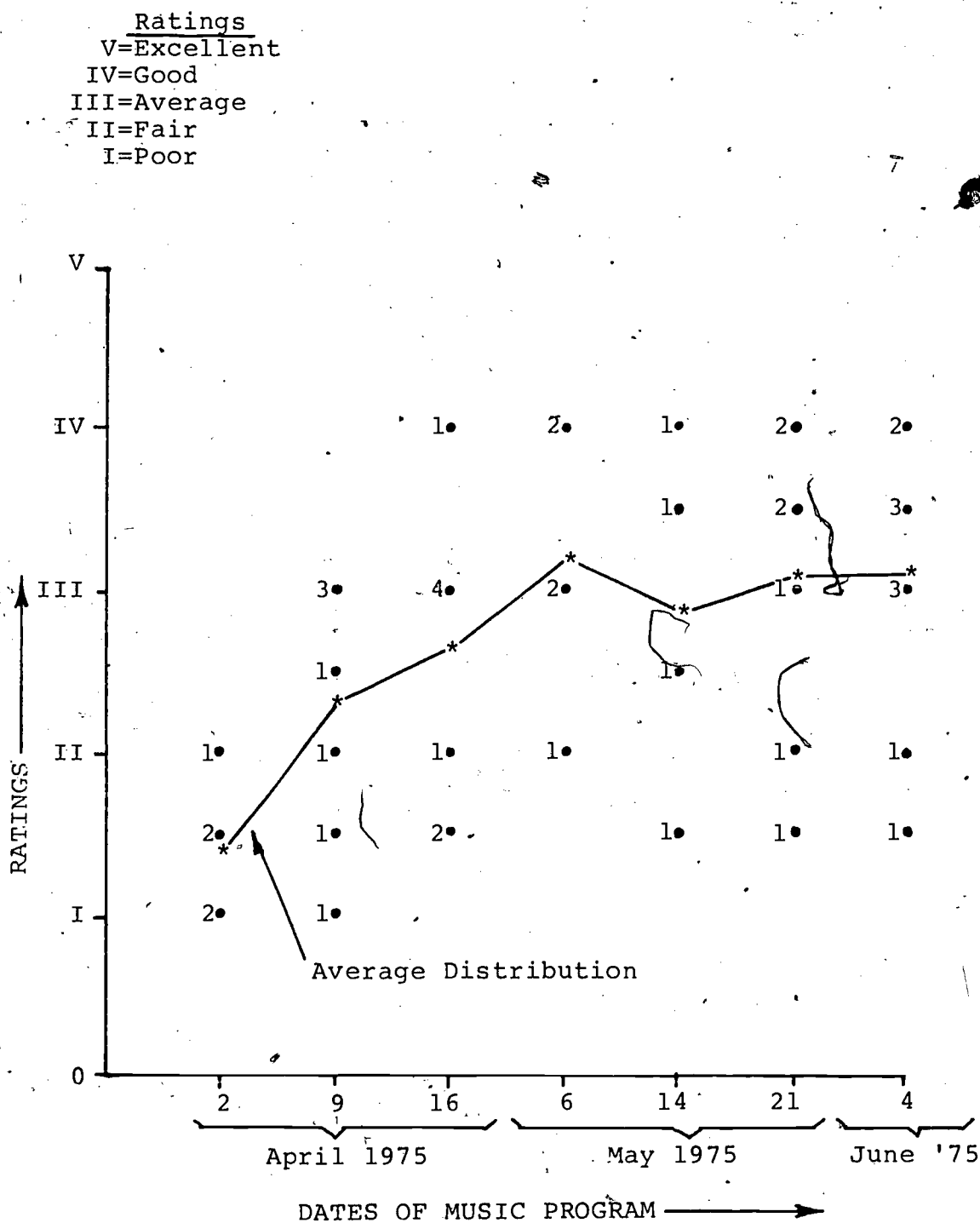


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SOCIALIZATION PROGRESS RATINGS GRAPHED BY NUMBERS OF STUDENTS
IN ATTENDANCE ON EACH DATE THAT MUSIC PROGRAM WAS IN SESSION



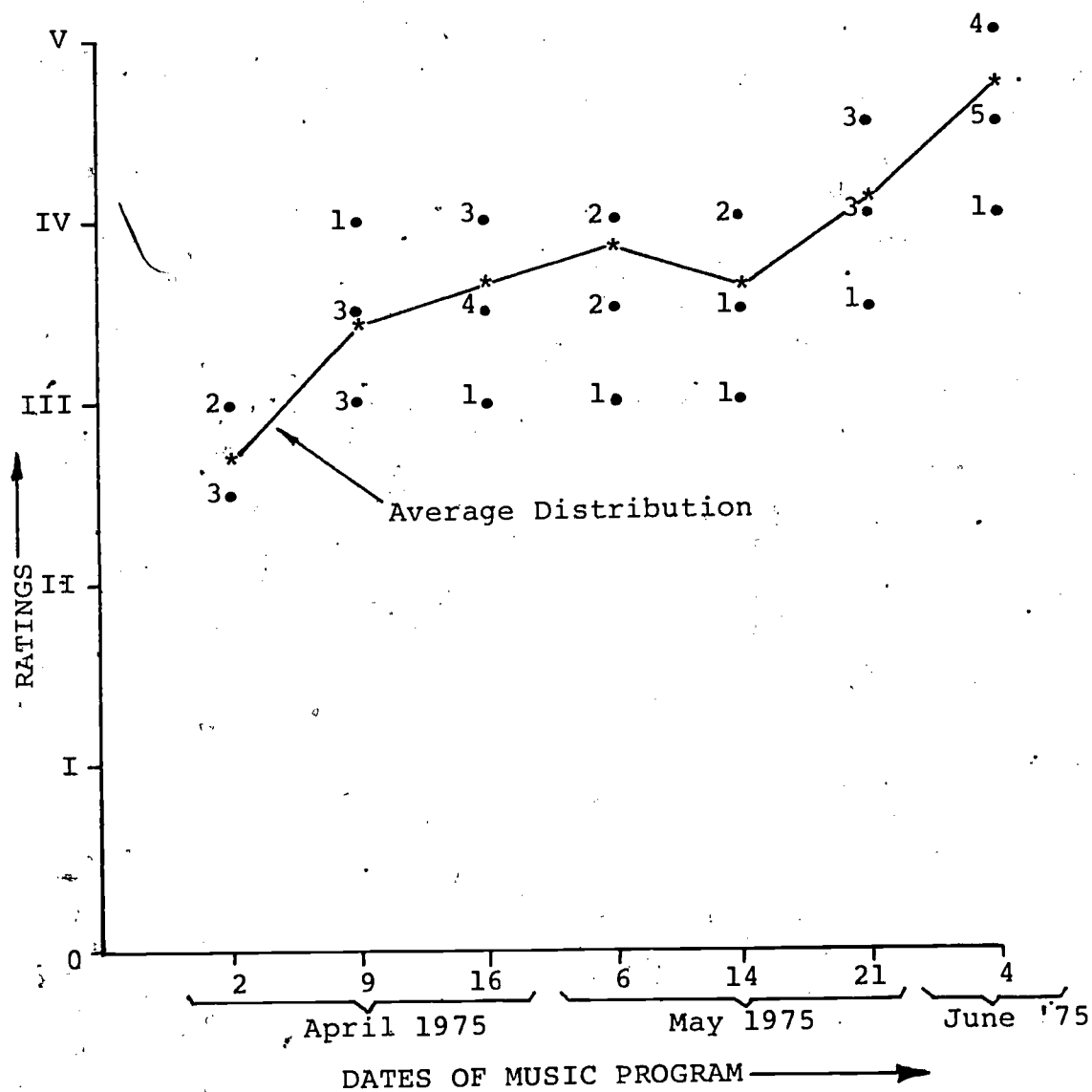
EDUCATION PROGRESS RATINGS GRAPHED BY NUMBERS OF STUDENTS
IN ATTENDANCE ON EACH DATE THAT MUSIC PROGRAM WAS IN SESSION



RECREATION PROGRESS RATINGS GRAPHED BY NUMBERS OF STUDENTS
IN ATTENDANCE ON EACH DATE THAT MUSIC PROGRAM WAS IN SESSION.

Ratings

V=Excellent
IV=Good
III=Average
II=Fair
I=Poor



2) Leisure Counseling

In providing leisure services to the students through counseling, the recreational therapist's goals were to:

- a) Acquaint the student to a variety of leisure possibilities in the community in which he lives
- b) Help the student make appropriate choices from among the possibilities
- c) Help them devise and follow a leisure plan

The objective was to help the handicapped student adjust to and become part of his environment in a way that would be rewarding and satisfying.

The first task was to assess the leisure needs and interests of the individual. The level of functioning with regard to the student's use of leisure time was assessed by asking each individual, "What do you do in your leisure time?" and by having each student list likes or dislikes on an inventory checklist (see Appendix F). After reviewing this information, the students were asked, "If you were given the necessary resources, what would you most like to do in your leisure time?"

A "real" and "ideal" leisure profile was established for each student whose response to this question differed greatly from his actual use of leisure time. The "real" being what the individual actually does with his leisure time and the "ideal" being what he would like to do with this time.

Bridging the gap between the real and the ideal was the second task. In accomplishing this, information was collected about leisure resources in the community and in the immediate area to identify: major public and private recreational agencies and their geographic location, the recreation professionals operating the programs and facilities, and the communication routes between the recreation agencies' staffs and the activities division program for handling referrals. Program schedules and the location of programs were also determined. A file card system was developed, and is still being added to, listing agencies, contact persons, programs, and pertinent information needed for referral and/or use.

The above mentioned information can be obtained by sending a questionnaire out to possible leisure activity resources. A suggested questionnaire is included in Appendix I.

Once the resource file was established, recommendations of suitable types of programs available in the community were provided to the student. In making these recommendations, the recreational therapist did not only focus on the advised or selected activity, but also on the feasibility of the activity.

Variables of feasibility included the following:

- a) social
- b) financial resources
- c) physical and mental abilities
- d) accessibility
- e) related background experiences

Presently, transportation problems have hindered students in availing themselves of community-based programs. When an adequate solution to this problem is worked out, the recreational therapist will make initial contacts for the students and do a follow-up on every individual referred to a community program.

If the program is found to be unsatisfactory, further attempts will be made to assist the individual in finding a more suitable program based on his interests, needs, and goals.

Once interest and motivation is established, the student will be encouraged to participate in leisure activities on his own.

3) Miniature Golf Course

Plans are being made for a portable three-hole miniature golf course. One unit has been given to the school to evaluate its accessibility and durability. The course is designed to be used by all multiply handicapped students. After the initial evaluation, holes 2 and 3 will be constructed. Specifications and material costs of the completed first hole are listed on page 20.

Game values will include strengthening self-concepts and self-image, improving standing tolerance, eye-ball contact, single response activity, follow through, joint range of exercising, fine and gross motor development, socialization, relaxation, and fun.

4) Adaptations and Modifications

Many of the adaptations and modifications which were originally designed to enable students to overcome problems of coordination and to increase functional independence have also increased recreational opportunities for the students. Examples of such adaptations include:

- a) Changing of knobs on record player controls (page 8)
- b) Detachable switches on tape recorder (page 10)
- c) Building of a work table (page 11)
- d) Adapting mouthstick for stereo operation (page 14)
- e) Adapting leaves to card readers (page 10)
- f) Adapting a microfilm reader in the library at Sharpe Health School





C. FUNCTIONAL MEASUREMENTS

Students were initially evaluated for independence in fifty areas of self-care by the staff (occupational therapist). The gain of independence in self-care, after application of bio-engineering techniques, is indicated in Charts 2 and 3.

Chart 2

Client with Major Disability			SELF CARE ACTIVITIES																																									
			Wheelchair Bound	DRESSING										BATH	HYGIENE					EATING					HAND MANIPULATION																			
				Shirt	Pants	Bra (female)	Socks-Hose	Tie Shoelaces	Buttons	Snap-Hooks	Zipper	Belt	Upper Extremity	Lower Extremity	Feet	Back	Comb-brush hair	Wash/Set Hair	Urination	Brush Teeth	Shave (male)	Use Utensils	Cut Nails	Drink from Glass	Open with Handle	Open Rackets	Unwrap Milk Carton	Chop Icing	Can Opener	Flush Toilet	Faucets	Door Knobs	Light Switch	Gloves fr. Objects	Pick up Objects	Drawers	Scissors	Radio/TV switches	Stapler	Handle Money	Lift Envelope	Carry object/lbs.	Write	Other
GR	Blind Quad	Yes																																										
VR	Quad	Yes		*																																								
RT	MD	Yes		*																																								
MT	MD	Yes		*																																								
WD	MD	Yes		*																																								
CF	Hoffman Disease	Yes		*																																								
LT	MD	Yes		*																																								
DM	CP	Yes																*																										
SM	Osteo Imper	Yes																*																										
AG	MD	Yes		*																																								
SL	CP	No		*																																								
HG	MD	Yes		*																																								
AW	CP	No																*																										
JL	Osteo Imper	No																*																										
HF	CP	Yes		*																																								
JL	Para	Yes		*																																								
KS	Arterio Mal-Brain	Yes																*																										
RJ	CP	No		*															*																									
DP	CP	No																*																										
ER	Osteo Imper	No		*															*																									
SR	Osteo Imper	No																																										
SP	Para	Yes																																										

Legend:

-  Independent Before Adaptations
-  Independent After Adaptations
-  Independence Still Lacking
-  Not Applicable

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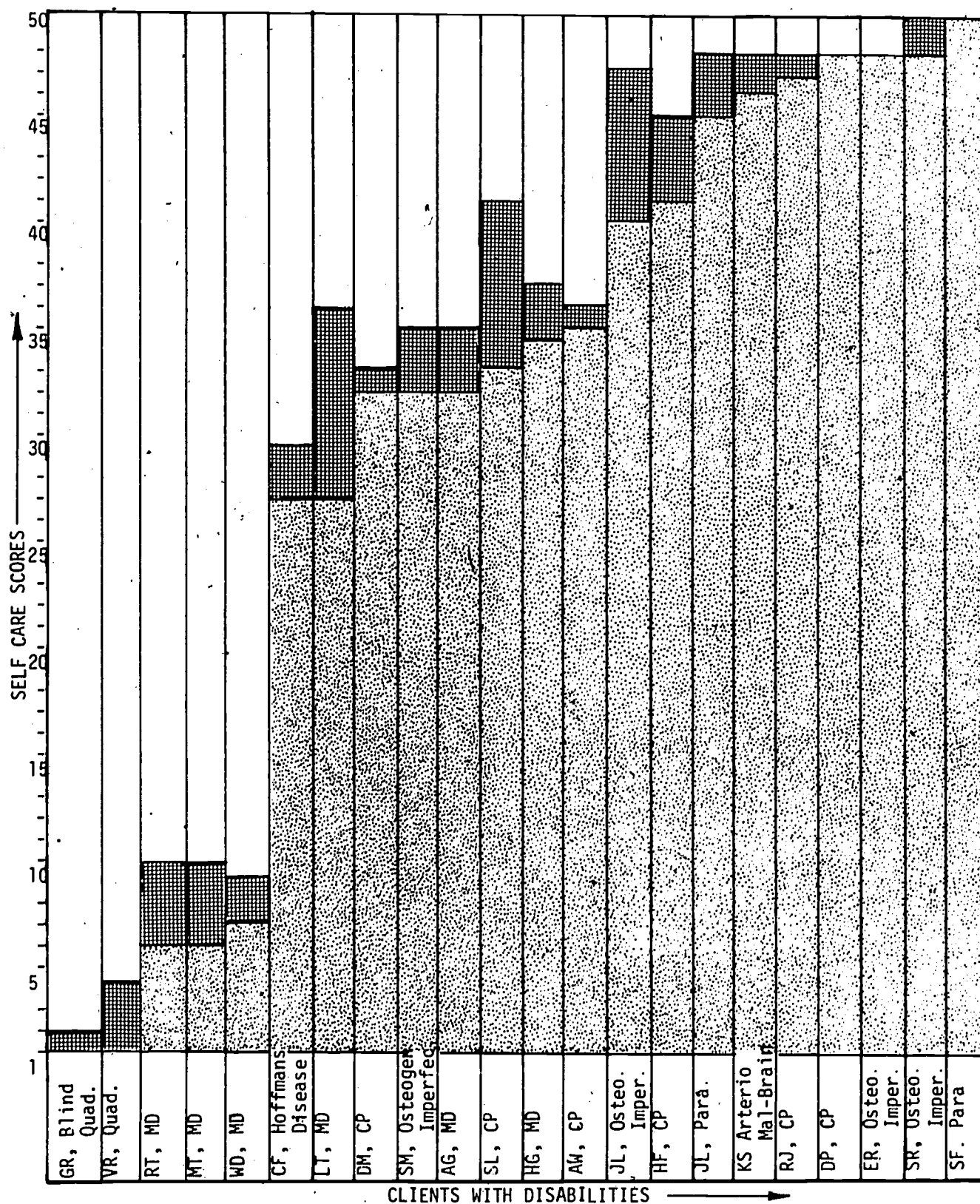
USE OF ADAPTIVE DEVICES TO INCREASE INDEPENDENCE IN SELF CARE

[illegible]

Independent Before Adaptations
Independent After Adaptations
Independence Still Lacking
icable

48A

INCREASED INDEPENDENCE DUE TO UTILIZATION OF ADAPTIVE DEVICES



- Independence in self care before adaptations
- Independence in self care after adaptations
- Independence still lacking

D. VOCATIONAL ORIENTATION

The concepts of positive attitude toward vocational potential were introduced to the project students at the October orientation meeting at the Sharpe Health School.

1) National College Fair

On December 11, 1974, a National College Fair was held at the Sheraton-Park Hotel in Washington, D.C. Counselors from approximately 350 colleges were on hand to disseminate information about course offerings, tuitions, and living expenditures at their respective institutions. Ten students of the Sharpe Health School were taken to the Fair by Sharpe School and project staff to expose the students to the academic world and its offerings. The students attending the Fair related that they had gained helpful information in spite of the fact that large crowds and structural barriers limited the accessibility to all of the college booths.

2) Microfilming

Eight students and a school staff member were selected and received pre-vocational training in microfilming skills at Sharpe Health School. Participants were first oriented to the world of micrographics, its terminology, and its vocational potential for the severely physically disabled by project staff at a meeting held on April 10, 1975 at Sharpe Health School. A self-learning package consisting of slides and a cassette audio tape was developed at the Job Development Laboratory. A microfilm camera and viewer were also provided to complete training. Books selected by the school staff were microfilmed by the students as part of their training. The purpose was twofold: (1) specific training in a marketable skill for severely disabled people, (2) greater access to books for visually impaired students, and students unable to turn pages, through use of an adapted microfilm viewer.

3) One-Hand Typing

In the course of developing jobs for disabled workers, many openings for clerk-typists are found. Certain students at Sharpe Health School who have use of only one hand could be trained as effective typists using a one-hand typewriter developed by the Typewriting Institute for the Handicapped in Phoenix, Arizona. The typing teacher at Sharpe Health School has been provided with such a typewriter by project staff for evaluation. Plans are being made at Sharpe to incorporate a training program utilizing this typewriter.

4) Summer Employment

Eight students (project participants) have been placed in clerical positions as part of a Federally funded youth summer employment program. Project staff are presently doing a job analysis of each work site to determine the exact requirements of the job as well as the accessibility of the work environment. A job analysis form, developed at the Job Development Laboratory, is being utilized in evaluating each work site (see Appendix J). The students' functional ability and the job analysis will form a basis for implementing bio-engineering techniques, if necessary, that will increase the productivity and the range of activities the students can perform on the job.

Summer employment will benefit students by providing an introduction to the world of work, work experience for a resume, and a valuable socialization experience in a non-protective environment.

E. EVALUATION OF FUNCTIONAL AND VOCATIONAL POTENTIAL

Using the functional activity file developed for each student, the project staff evaluates what modifications can be recommended and what specific adaptations can be devised. They then suggest specific devices and techniques to solve the problem of a particular student who is being evaluated.

Recommendations for each individual are based on an approach which combines modification of the environment and adaptive devices for the individual. In all instances, a cost-effective approach is the determinant in the selection of environmental and orthotic adaptations for each student.

The following example demonstrates how bio-engineering services enhanced the productivity of a former Sharpe Health School student. As a result of this, the student is now gainfully employed as a mail clerk at the Department of Justice.

EXAMPLE

C.F. is a personable, 20 year old, black client who was born with Werdnig-Hoffman's Disease of muscular atrophy. He is functionally a quadriplegic and is confined to an electric wheelchair. His upper extremity functions are very limited and marked by weakness, although he has limited pinch and grasp which enables him to perform some desk activities.

Since 1973, he has been homebound without any meaningful activity. He has expressed a great desire to work and to be able to get out of his house so that he could interact with people. Initially, it was not considered feasible for him to be able to commute to work as transportation costs for vehicles with a ramp are prohibitive (\$24 to \$40 per round trip).

Due to cooperation by special consent from the Director of United Cerebral Palsy, the Job Development Laboratory was able to solve the transportation problem. United Cerebral Palsy allowed the organization's van to transport him to and from work for a fee of \$25 per week.

With the transportation problem solved, a job was secured with the Department of Justice for C.F. to become a mail clerk. The job analysis revealed that C.F. could perform the job tasks if job site adaptations were made. The job functions include opening envelopes, stamping the contents, reading the letters, stapling when necessary, and distributing the mail into appropriate files.

Many simple changes were made to enable C.F. to be productive:

- 1) A height-adjustable table 2' x 5' was purchased to allow close wheelchair access at the height of 26 inches
- 2) A tray adjusted to be 10 inches in height from the floor was placed to his left for the mail to be deposited for easy access. To facilitate easy sorting of mail by a wheelchair-bound clerk, mail sorters were designed according to ideal height and angle. The sorters are arranged with a 24-slot bank on the right of the chair and a 12-slot unit on the left. The slot design provides convenience of sorting mail by the clerk as well as easy removal of sorted mail by others.

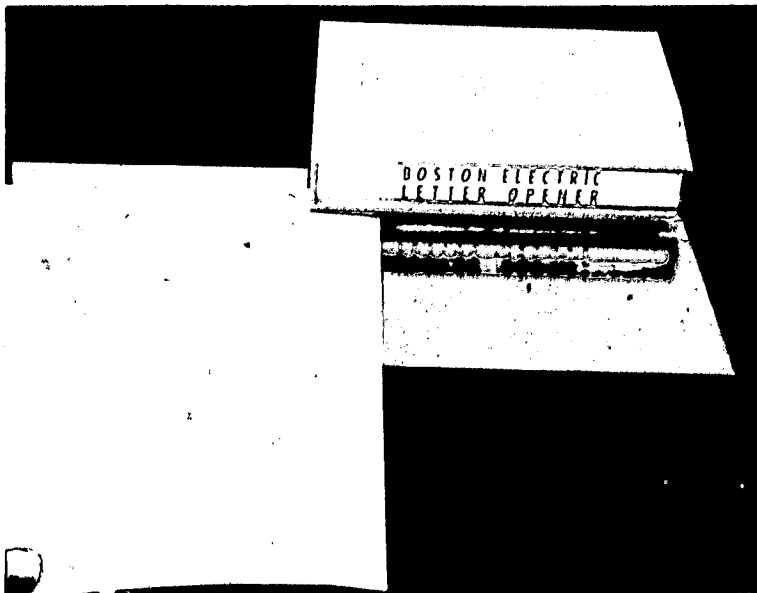
- 3) An electric letter opener was deemed necessary as C.F.'s speed in opening letters using a letter opener along with a universal cuff was too slow.



(A secretary of the Job Development Laboratory is demonstrating the feasibility of using such devices for the non-handicapped population.)

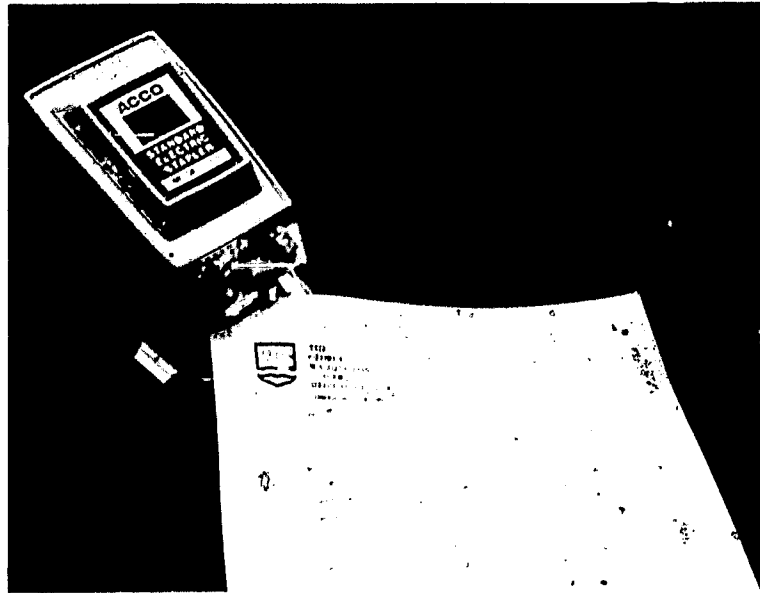
MAIL SORTER

Materials: wood, masonite, Laytex paint Cost of materials: \$75.00



BOSTON ELECTRIC LETTER OPENER

Cost: \$49.95



ACCO STANDARD ELECTRIC STAPLER

Cost: \$39.95

F. MEETINGS

1) Board of Advisors Meeting

Advisors and consultants to the project were informed of staff activities and achievements during the first half of the project at a meeting held at The George Washington University on March 5, 1975 (Appendix K).

A general discussion of the project staff's future plans as well as recommendations from advisors and consultants followed this report.

2) Staff, Parent, and Student Meetings

The staff of Sharpe Health School, student project participants, and their parents were oriented to project achievements and future areas of concern at meetings held on March 19, 1975 and March 26, 1975 at Sharpe Health School (Appendices L, M). Involvement of staff, students, and parents at these meetings has increased motivation and cooperation of all concerned in achieving the project goals.

3) Board of Advisors Meeting

A Board of Advisors Meeting was held at The George Washington University on June 10, 1975. At this time, a tentative outline for the program to be used at a national workshop to disseminate project results was discussed. Participants of this meeting are listed in Appendix N.

WORKSHOP AND FINAL REPORT

A practical workshop will be held in December of 1975 to demonstrate how low-cost, simply designed, bio-engineering adaptations can be used to increase functional level and work capacity. Audiovisual materials will be utilized at this workshop and will be made available to interested agencies and community organizations to be used as models in program planning for disabled persons on a locals, state, and national level.

Present plans are to invite staff members from Rehabilitation Services Administration (RSA), vocational rehabilitation facilities, and schools for handicapped children in Region III (Washington, D.C.; Maryland; Virginia; Delaware; and Pennsylvania), Research and Training Centers (R & T Centers), and University Affiliated Facilities (UAF) funded under RSA to this workshop.

This final report, which contains the compilation of all project results, will be utilized as the primary resource material for the workshop. Copies of this report are available to all professionals working with developmentally disabled populations and can be obtained by writing to:

K. Mallik, Director
Job Development Laboratory
The George Washington University
Medical Center
2300 Eye Street, N.W., Room 420
Washington, D.C. 20037
(202) 331-6847

APPENDIX

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GENERAL DESCRIPTION OF SHARPE HEALTH SCHOOL STUDENTS

STUDENT	AGE	GRADE	DISABILITY	MOBILITY	GENERAL
H.F.	19-3	11	C.P. Spastic Quadriplegia	Wheelchair dependent Can propel wheelchair with lower extremities	Has limited functional communication
S.L.	19-11	11	Cerebral Palsy Athetoid	Ambulatory (severe athetoid movements)	Lt. upper extremities functional adapted written independent dressing ability no
W.M.	16-6	11	Spina Bifida	Can ambulate with braces and crutches.	Upper
A.G.	17-6	11	Muscular Dystrophy	Wheelchair (full-time) Limited ability to propel chair.	Marked limitations; dependent communication
D.T.	16-5	11	Muscular Dystrophy	Wheelchair (full-time)	Marked limitations; dependent communication
H.G.	18-7	12	Muscular Dystrophy	Wheelchair (full-time) Can propel wheelchair on smooth surface.	Weakness has fair in eating
K.S.	18-10	12	Arterio-venous malformation in brain	Wheelchair (full-time)	Upper right hand fair. dressing

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GENERAL DESCRIPTION OF SHARPE HEALTH SCHOOL STUDENTS

Appendix A

GRADE	DISABILITY	MOBILITY	GENERAL FUNCTIONING
11	C.P. Spastic Quadriplegia	Wheelchair dependent Can propel wheelchair with lower extremities	Has limitation of upper extremity function; is independent in communication and eating skills
11	Cerebral Palsy Athetoid	Ambulatory (severe athetoid movements)	Lt. upper extremity, barely functional; can sign name only; uses adapted electric typewriter for written communication; essentially independent in eating and in dressing skills; rt. upper extremity non-functional.
11	Spina Bifida	Can ambulate with braces and crutches.	Upper extremities normal.
11	Muscular Dystrophy	Wheelchair (full-time) Limited ability to propel chair.	Marked weakness of upper extremities; has fine hand skills; independent in eating and in communication skills.
11	Muscular Dystrophy	Wheelchair (full-time)	Marked weakness of upper extremities; has fine hand skills; independent in eating and in communication skills.
12	Muscular Dystrophy	Wheelchair (full-time) Can propel wheelchair on smooth surface.	Weakness of upper extremities; has fine hand skills; independent in eating and communication.
12	Arterio-venous malformation in brain	Wheelchair (full-time)	Upper extremity coordination fair; rt. hand use good. Lt. hand use fair. Independent in eating, dressing, and communication skills

STUDENT	AGE	GRADE	DISABILITY	MOBILITY	GENERAL
A.W.	17-6	7	Cerebral Palsy Spastic Paraplegia	Long -leg braces & crutches. Independent in ambulation and eleva- tion with equipment (low endurance on stairs)	Normal
R.J.-	16-7	9	Cerebral Palsy Spastic Paraplegia	Long-leg braces and crutches; ambulatory but needs some assistance in elevating activities.	Has g
D.M.	18-10	9	Cerebral Palsy	Wheelchair	Very
S.M.	17	10	Osteogenesis Imperfecta	Wheelchair	Some
E.R.	17-3	9	Osteogenesis Imperfecta	Wheelchair	Good
S.F.	15-4	9	Traumatic Para- plegia	Wheelchair (sometimes uses crutches)	Good
W.D.	19-4	Grad.	Muscular Dystrophy	Wheelchair	Very
M.T.	21	Grad.	Muscular Dystrophy	Wheelchair	Very
R.T.	19-10	Grad.	Muscular Dystrophy	Wheelchair	Very
C.F.	19-4	Grad.	Hoffman's Disease	Wheelchair	Some
J.L.	19-11	12 (trans- ferred to Woodson High)	Traumatic Para- plegia	Wheelchair	Exce
D.H.	15-7	10	Osteogenesis Imperfecta	Wheelchair (sometimes walks on crutches)	Normal
J.L.	18	10	Osteogenesis Imperfecta	Wheelchair (sometimes walks on crutches)	Normal

GRADE	DISABILITY	MOBILITY	GENERAL FUNCTIONING
7	Cerebral Palsy Spastic Paraplegia	Long -leg braces & crutches. Independent in ambulation and elevation with equipment (low endurance on stairs)	Normal upper extremities.
9	Cerebral Palsy Spastic Paraplegia	Long-leg braces and crutches; ambulatory but needs some assistance in elevating activities.	Has good upper extremities.
9	Cerebral Palsy	Wheelchair	Very limited.
10	Osteogenesis Imperfecta	Wheelchair	Some limitation.
9	Osteogenesis Imperfecta	Wheelchair	Good
9	Traumatic Paraplegia	Wheelchair (sometimes uses crutches)	Good
Grad.	Muscular Dystrophy	Wheelchair	Very limited.
Grad.	Muscular Dystrophy	Wheelchair	Very limited
Grad.	Muscular Dystrophy	Wheelchair	Very limited
Grad.	Hoffman's Disease	Wheelchair	Some limitations.
12 (transferred to Woodson High)	Traumatic Paraplegia	Wheelchair	Excellent.
10	Osteogenesis Imperfecta	Wheelchair (sometimes walks on crutches)	Normal upper extremities.
10	Osteogenesis Imperfecta	Wheelchair (sometimes walks on crutches)	Normal upper extremities.

STUDENT	AGE	GRADE	DISABILITY	MOBILITY	GENERAL
S.R.	16	9	Osteogenesis Imperfecta	Long-leg braces and crutches	Normal u
D.P.	18-6	8	C.P. Tension Athetoid	Long-leg braces and crutches	Good u
V.R.	17-2	11	Quadriplegic	Mouth control--electric wheelchair	Very limi
G. R.	12	5	Blind Quadriplegia	Wheelchair Dependent--unable to propel chair himself	Very limi in finger
L.B.	9	Profoundly Retarded Program	C.P. Quadriplegic Mentally Retarded	Wheelchair Dependant--unable to propel chair herself	Very limi

Appendix A (cont'd)

GRADE	DISABILITY	MOBILITY	GENERAL FUNCTIONING
9	Osteogenesis Imperfecta	Long-leg braces and crutches	Normal upper extremities.
8	C.P. Tension Athetoid	Long-leg braces and crutches	Good upper extremities.
11	Quadriplegic	Mouth control--electric wheelchair	Very limited.
5	Blind Quadriplegia	Wheelchair Dependent--unable to propel chair himself	Very limited; no sensation in finger tips
Profoundly Retarded Program	C.P. Quadriplegic <u>Mentally Retarded</u>	Wheelchair Dependant--unable to propel chair herself	Very limited

PARENT ORIENTATION

BIO-ENGINEERING SERVICES TO DEVELOPMENTALLY
DISABLED ADOLESCENTS

The George Washington University Medical Center
Job Development Lab
and
Sharpe Health School

October 2, 1974

- 9:20 - 9:30 INTRODUCTION: Mrs. Marian Siler, Principal
- 9:30 - 9:50 MOVIE: The World of Work for the Severely Disabled
- 9:50 - 10:00 ORIENTATION: Kalisankar Mallik, Director; Medical
and Systems Engineer
- 10:00 - 10:15 FUNCTIONING IN DAILY ACTIVITIES: Evelyn Smith,
Project Coordinator, Registered
Occupational Therapist, M.Ed. in
Special Education
- Questions and Answers
- 10:15 - 10:30 VOCATIONAL GUIDANCE: Ruth Sablowsky, Vocational
Coordinator, M.Ed. in Rehab. Counseling
- 10:30 - 10:45 INSTRUCTION AND TRAINING: Pei-hwa Kung Foo,
Instruction and Training Supervisor,
M.S. in Education
- 10:45 - 11:00 RECREATION: Cindy Walker, Recreational Therapist
- Questions and Answers
- 11:00 - 11:15 SUMMARY Mr. Mallik
- 11:15 - 12:00 COFFEE AND RAP



THE
GEORGE
WASHINGTON
UNIVERSITY
MEDICAL CENTER

2300 Eye Street, N.W. / Washington, D.C. 20037

*Division of Rehabilitation Medicine
Research & Training Center*
Ross Hall, Room 420
(202) 331-6847

December 9, 1974

Mr. and Mrs. Parent
Street Address
Washington, D.C.

Dear Mr. and Mrs. Parent:

We are indeed sorry that you were unable to attend the Parent Orientation given on October 2, 1974. All students selected to participate in the Joint Project being conducted by our staff at George Washington University and the Sharpe Health School were referred to us by Mrs. Marian Siler, the principal at Sharpe.

The purpose of this project is to improve the quality of life for disabled students. Our staff will be evaluating your child to find ways in which he can become more independent. The number of activities your child can perform in self-care and recreation skills will be increased when possible by making simple changes in his surroundings and by supplying him with mechanical aids to increase his strength. We will also concentrate on improving pre-vocational skills. A disabled student can find a good job in areas such as the information industry if he is given a positive attitude toward his future employment possibilities.

As we move forward, our project staff will be keeping you informed of our progress with your child and asking for your cooperation. Please feel free to ask me or members of the staff any questions you might have about our work with your child. After our initial evaluations have been completed, we will be in touch with you.

Sincerely,

Sheldon Yuspeh, Coordinator
Sharpe Health School Project

SY:jj

FUNCTIONAL EVALUATION OF PHYSICALLY DISABLED FOR EMPLOYMENT
The George Washington University Medical Center
Job Development Laboratory
2300 Eye Street, N.W.
Washington, D.C. 20037

I. Background Information:

A. Name _____	G. Referred by: _____	I. Social Security _____
B. Address _____	Address: _____	J. Financial _____
C. Phone _____	Phone: _____	
D. Age _____ Birthdate _____ Sex _____	Date: _____	K. Family Income _____
E. Marital Status _____	Reason: _____	L. Insurance _____
F. Dependents _____	H. Counselor: _____	
	Address: _____	
	Phone: _____	

II. Medical Characteristics:

A. Diagnosis _____	E. Physician: _____	I. Medical Record _____
B. Prognosis _____	Phone: _____	
C. Allergies _____	F. Precautions _____	J. Devices (Prosthetic/Adaptive) _____
D. Medications _____	G. Work Tolerance _____	
	H. Fatigue _____	

III. Physical Summary:

IV. Vocational History

A. Education: ☐ Elementary; ☐ High; ☐ Vocational; ☐ Business; ☐ College; ☐ Graduate

B. Vocational Experience:

Employer	Position	Dates	Liked/Disliked	Reason Job Terminated

C. New Job Search: Yes _____ No _____ How soon after job ended? _____ Assistance _____
Methods Used: _____ Type job sought _____

D. Hobbies: _____ E. Major time consuming activities: _____

FUNCTIONAL EVALUATION OF PHYSICALLY DISABLED FOR EMPLOYMENT

The George Washington University Medical Center

Job Development Laboratory

2300 Eye Street, N.W.

Washington, D.C. 20037

Appendix D

DATE _____

on:

G. Referred by: _____
 Address: _____
 Phone: _____
 Date: _____
 Reason: _____
 H. Counselor: _____
 Address: _____
 Phone: _____

I. Social Security # _____
 J. Financial Assistance _____
 K. Family Income _____
 L. Insurance # _____

Sex _____

ics:

E. Physician: _____
 Phone: _____
 F. Precautions _____
 G. Work Tolerance _____
 H. Fatigue _____

I. Medical Rehab. Summary _____
 J. Devices Presently Used (Orthotic & Adaptive) _____

Elementary; ☐ High; ☐ Vocational; ☐ Business; ☐ College; ☐ Grad School; Other _____

ence:

Position	Dates	Liked/Disliked	Reason Job Terminated	Pay

Yes _____ No _____ How soon after job ended? _____ Assistance _____

Type job sought _____ Occupation Goal _____

E. Major time consuming activity: _____

V. Physical Characteristics:

	HAND DOMINANCE				GRASP				COORDINATION				BALANCE				REACH				WHEEL											
	Pinch	Palmer (hold phone)	Lateral (thumb-to finger side)	Tip prehension (hold pencil)	Spherical (grasp door knob)	Opposition (thumb to finger tip)	Release (open hand)	Strength	Eye-hand	Hand-mouth	Spasticity	Ataxia	Finger dexterity	Sitting	Chair with arms	Wheelchair	Standing	Walking	VISION	Endurance	Stability	Reach to 90°	Forward - distance	Height	Side	Strength - lift lbs.	Manual	Electric	Width	Desk Clearance	Removable	Desk
Severely Impaired																					R.											
Moderately Impaired																					L.											
Minimally Impaired																																
Intact																																

DEVICES NEEDED

VI. Functional Characteristics:

A. Level of Self-Care

Score: _____

		DRESSING										BATH		HYGIENE				EATING			HAND MANIPULATION																				
		Shirt	Pants	Bra	Socks - Hose	Shoes	Tie Shoelaces	Buttons	Snaps - Hooks	Zipper	Corset	Brace	Belt	Upper Extremity	Lower Extremity	Feet	Back	Comb-brush hair	Wash Hair	Set Hair	Brush Hair	Shave	Flugh Toilet	Fingert	Use Utensils	Cut Meat	Drink from Glass	Cup with handle	Open Sugar Pack.	Door Knobs	Light Switch	Drawers	Objects fr. floor	Clothes fr. closet	Scissors	Wind Watch	Radio-l.v. Switch	Handle Mo	Open		
L E V E L	Maximum Impaired																																								
	Moderate Impaired																																								
	Minimal Impaired																																								
	Independent																																								
T I M E	Time:																																								
	Total Time:																																								

* Check Everest Jennings wheelchair prescription form.

UNC. EVAL FORM (Job Development Lab, The Geo. Washington Univ. Medical Center, 2300 Eye St.,

VII. Functional Characteristics:

B. Ambulation Yes No

Walks independently		
Brace		
Corset		
Cane		
Crutch		
Walker		
Manual Wheelchair		
Electric		
Stairs		
Curbs		

C. Transfers

Rise from Lying		
Rise from Sitting		
Bed		
Chair		
Wheelchair		
Toilet		
Tub		
Shower		
Car		
Stow w/c in Car		

D. Transportation

Own Car		
Friends Car		
Relative's Car		
Drives Independ.		
Taxi		
Mobile Care Van		
Bus		
Subway		
Train		
Drivers Licence		

VIII. Communication:

A. Motor Impairment

Receptive		
Expressive		
Hesitation		
Wrong words		
Dysarthria		
No speech		

B. Verbal Ability

Clear Enunciation		
Verbally Proficient		

C. Hearing affected

Yes No

D. Reading

Vision Impaired		
Impairment Corrected		
Can Comprehend		
Hold Books		
Lift Books		
Turn Pages		

IX. Work Samples:

A. Writing

Hold Pencil		
Write		
Print		
Felt Tip Pen		
Ball Point Pen		
Pencil		
Erase		

B. Desk Activities

Desk Height Needed		
Manipulates Papers		
Paper Clips		
Stapler		
Rubber Bands		

C. Keyboard Typing Calculator

Table Height		
Speed		
Errors		
Touch Type		
One Finger		
One Hand		
Universal Cuff		
Mouth		
Head Set		

D. Telephone

Reach		
Dial - Standard		
Touchtone		
Needs Extension Arm		
Needs Speaker phone		

E. Filing

Cabinets		
Index Card		
Open		
Alphabetical		
Numerical		

F. Tape R

Reach	
Press	
Needs	
Speech	
Device	

G. Microf

Thread	
Photog	
Speed	

H. Xerox

Insert	
Feed D	
Load P	
Remove	
Put in	
Clean	

I. Microf

Insert	
Operat	
Record	

X. A. Home S

Apartm	
Detach	
Nursin	
Owne	
Rents	

B. Archit

# Step	
# Floo	
Elevat	
Ramps	
Door W	
Nonacc	
Parkin	
Privac	
Room f	

XI. Orthotic

Yes No

[illegible]

Yes No

Yes	No
-----	----

Vision Impaired		
Impairment Corrected		
Can Comprehend		
Hold Books		
Lift Books		
Turn Pages		

A.	Writing		
	Hold Pencil		
	Write		
	Print		
	Felt Tip Pen		
	Ball Point Pen		
	Pencil		
	Erase		

Desk Height Needed		
Manipulates Papers		
Paper Clips		
Stapler		
Rubber Bands		

Table Height		
Speed		
Errors		
Touch Type		
One Finger		
One Hand		
Universal Cuff		
Mouth		
Head Set		

Reach		
Dial - Standard		
Touchtone.		
Needs Extension Arm		
Needs Speaker phone		

Cabinets			
Index Card			
Open			
Alphabetical			
Numerical			

Yes No

Reach		
Press Switches		
Needs Foot Pedal		
Speech Legible		
Devices		

Threading		
Photographing		
Speed		

Insert Key		
Feed Document		
Load Paper		
Remove Jammed Papers		
Put in Ink		
Clean Glass Plates		

Insert Film		
Operate Knobs		
Record Corrections		

Apartment		
Detached Home		
Nursing Home		
Owns		
Rents		

# Steps Into House		
# Floors		
Elevator		
Ramps		
Door Widths		
Nonaccessible Rooms		
Parking		
Privacy		
Room for Equipment		

XI. Orthotic Evaluation:

XII. Behavioral Characteristics:

A. Tests: Gen. Intell. Score _____ Test _____ Dates _____ Verbal _____
 Kuder Interest Score _____ Highest Interests (1) _____ (2) _____

B. Observations:

1. Appearance: Meticulous _____ Neat _____ Poor _____ Neglected _____
2. Motivation (confidence and self-perception)
- | | Very Good | Good | Average |
|---|-----------|------|---------|
| a) Confidence in ability to learn | | | |
| b) Confidence in ability to succeed in work | | | |
| c) Desire to work | | | |
3. Cooperation during interview
- a) Participation _____ b) Attitude _____
- _____ Initiated discussion _____ Amiable _____
- _____ Responded appropriately _____ Suspicious _____
- _____ Short responses _____ Neutral _____
- _____ Avoided speaking _____ Hostile _____
4. Family Support: _____ Emotional Support _____

Name	Good	Adequate	Rejected
Spouse			
Mother			
Father			
Siblings			

XIII. Physical Characteristics:

A. Hand Dominance _____

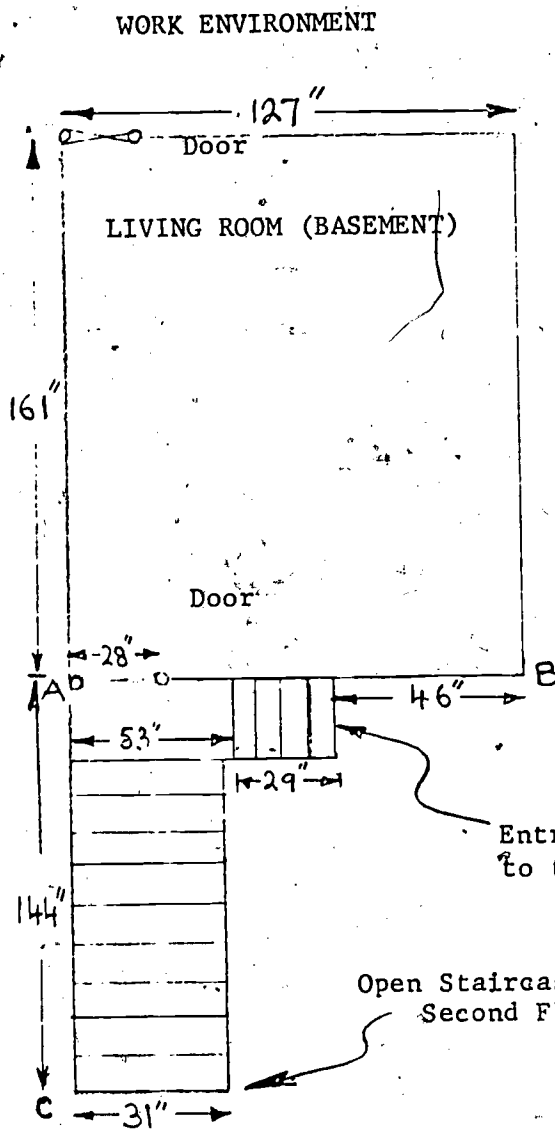
B. Physical Evaluation

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RIGHT

LEFT

	Strength	Range of Motion	Spasticity	Contracture	Pain	Strength	Range of Motion	Spasticity
1. Shoulder:								
Flexion								
Extension								
Abduction								
Adduction								
Horizontal Abd.								
Horizontal Add.								
2. Elbow:								
Flexion								
Extension								
3. Forearm:								
Pronation								
Supination								
4. Wrist:								
Flexion								
Extension								
5. Finger:								
Flexion								
Extension								

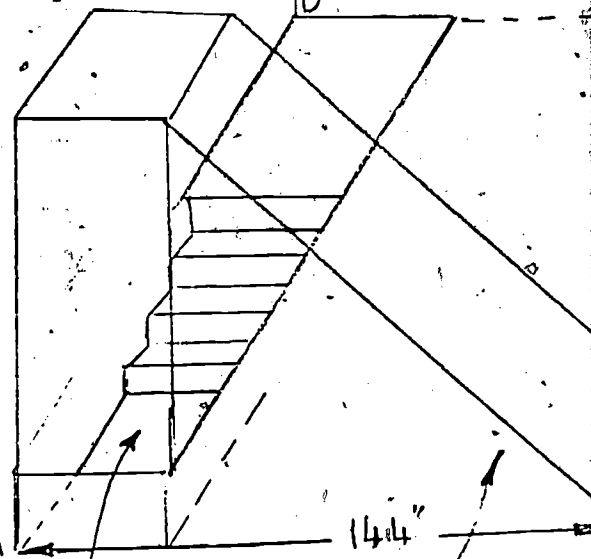


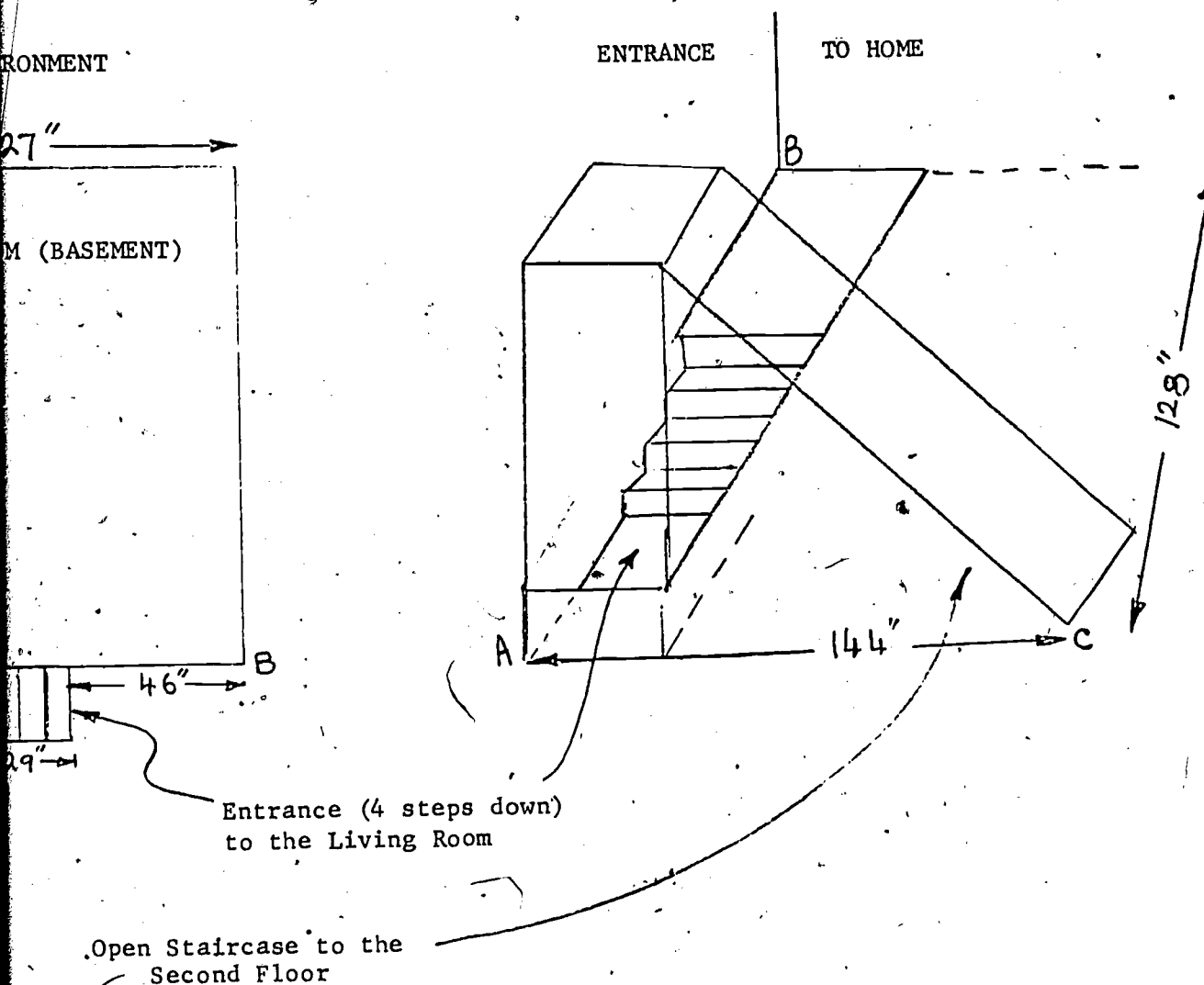
Entrance (4 steps down)
to the Living Room

Open Staircase to the
Second Floor

ENTRANCE

TO HOME





72A

RECREATIONAL INTERESTS

Have you ever participated in any of the following activities?

ACTIVITY	YES		Skill					COMMENTS	
	F	I	Excellent	Good	Fair	Poor	No, would like to learn		Not interested
I. <u>Table & Board Games</u>									
1. Checkers									
2. Chess									
3. NokHockey									
4. Pool - Bumper Pool									
5. Parcheesi									
6. Chinese Checkers									
7. Bridge									
8. Monopoly									
9. Card Games									
10. Ping-Pong									
11. Shuffleboard									
12. Darts									
13. Ring Toss									
14. Bingo									
15. Solitaire									
16. Word Games (Scrabble, Spill and Spell)									
17. Concentration									
18. Puzzles									
19. Model Racing Cars									
20. Dominoes									
21. Bean Bag Toss									
22. Other Table Games									
<u>Active Games</u>									
1. Basketball									
2. Bowling									
3. Football									
4. Softball									
5. Volleyball									
6. Badminton									
7. Archery									
8. Swimming									
9. Tennis									
10. Croquet									
11. Frisbee									
12. Horseshoes									
13. Sailing/Boating									
14. Sledding									
15. Wrestling/Boxing									
16. Fishing									
17. Other active games									

ACTIVITY	Frequency						COMMENTS
	Frequently	Infrequently	Excellent	Good	Fair	Poor	
I. Crafts							
1. Candle making							
2. Yarn sculpture							
3. Wood & metal working							
4. Gardening							
5. Collecting (circle)							
Stamps, photos, coins,							
posters, rocks, shells,							
models, dolls, bottles,							
match covers, recipes							
6. Cooking							
7. Macrame							
8. Knitting-Crocheting							
9. Weaving							
10. Puppet-making							
11. Decoupage							
12. Other crafts							
Art & Music							
1. Photography							
2. Painting							
3. Sculpture							
4. Rhythmic Exercise							
5. Singing							
6. Plays-Drama							
7. Playing Instruments							
8. Creative Writing							
(poetry, stories)							
9. Listening to Music							
Social Activities							
1. Movies							
2. Dining Out							
3. Travel							
4. Camping							
5. Reading							
6. Television							
7. Entertaining Friends							
8. Church							
9. Clubs							
10. Other Social Activities							

Evaluation and Plans:

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PSYCHOLOGICAL TESTING

K. S.

January 22, 1975

CA 18-10

D.O.B. 3/25/56

Grade 12

TESTS ADMINISTERED:

- 1/22/75 Wechsler Intelligence Scale for Children (WISC)
(Verbal half of test)
(Performance portion of test was not given in view of visual difficulties)
- 1/27/75 Peabody Individual Achievement Test (PIAT)
Reading Comprehension Sub-Test

GENERAL OBSERVATIONS:

K. appears to have a slight hearing problem as I needed to speak a little louder than usual to make myself heard clearly and K. asked me to sit on her left side so she could hear me better. That is also the side of her good eye so I assume it was easier for her to see me as well. K. reads fine with large print type--the specific degree of enlargement required can be determined perhaps in specific testing with varied materials.

K. is a proud girl with a very good sense of humor. She enjoys the company of adults and she feels comfortable talking with them and engaging in teasing exchanges. In school, she appears to shine in areas like English where she enjoys writing poetry. She worked hard on the test and tried to do her best.

TEST RESULTS:

On the reading test, K. scored at the top of 7th grade level--7.5-- which would be half way between 7th and 8th grade level. She sounds out words well even if she's never seen them before. She reads slowly but carefully. She tried hard to read perfectly and often went over a word several times to make sure she read it correctly. Her reading recognition, ability to read and sound out words (with no comprehension of meaning required) appears higher than her comprehension. At the higher levels, it was the weakening in her vocabulary that affected her comprehension.

On the WISC, verbal section, K. scored in the normal or average range of intelligence. Her strengths were in verbal reasoning and common sense, social judgment, and in abstract verbal concepts. She was weak in expressing herself in spoken words but writes very sensitive, well-thought-out poetry. Her receptive vocabulary (that which she understands) was weak as was her immediate recall (short-term memory for a string of numbers read to her). K. had some difficulty in the mental computations required for the arithmetic test. She set up the problems well for the most part but made computation errors in her head.

The fact that K. scored average and a little above average in common sense & social judgment skills is very significant as she has had many limited experiences. For example, one question involved a train and she's never been on a train but figured out a logical answer anyway. Occasionally her thoughts became cluttered in her head and she couldn't express clearly what she wanted to say, although she knew what she wanted to say.

Her limited life experiences are in evidence in her vocabulary score as well, as there was much variability and gaps in her knowledge. In other words, she knew some harder words, but missed some easier words. These gaps in knowledge are typical of a student who has had a pattern of illness and absence and whose education time has been broken up somewhat as she went through school. In her speech, she uses good, mature vocabulary but reading (seeing small print) is hard for her so she doesn't read as much as she could and is not exposed to many words.

She can use large print reading materials.

GW/kk

MUSIC PROGRAM LESSON PLANS

<u>DATE</u>	<u>PLANS</u>
April 2, 1975	<ol style="list-style-type: none"> 1. Evaluate the existing musical abilities of the students. (Abilities vary as some students already play such instruments as guitar, electric organ, and drums while others have no formal music background.) 2. Plan, with the students, the format of the music program by offering them various options such as: learning to read music and play instruments, singing, listening to various forms of music for exposure and appreciation, and choosing the type of music and instruments to which they wish to play and listen.
April 9, 1975	<ol style="list-style-type: none"> 1. Introduce the concepts of rhythm, beats, and measure to students. 2. Practice elementary clapping rhythms. 3. Expose students to various forms of rhythm instruments. (i.e. maracas, tambourine, drum, cymbals, bells, tone blocks, and sound blocks.) Discuss briefly the history of each instrument and the materials of which they are made. 4. Drill students on simple rhythm exercises using rhythm instruments. 5. Recreation time - listen to records.
April 16, 1975	<ol style="list-style-type: none"> 1. Review drills on rhythm instruments and have students play instruments to a record of their choice. 2. Begin instruction in reading music by introducing students to treble clef sign and notes on staff paper. 3. Instruct students in how to play these notes on the piano and coronet. 4. Drill students on simple exercises using both instruments. 5. Recreation time - listen to records.
May 6, 1975	<ol style="list-style-type: none"> 1. Review basic notes on staff paper and practice exercises on the piano and coronet learned in previous session. 2. Combine piano, coronet, rhythm instruments and drums in basic exercises and practice.

DATEPLANS

May 14, 1975

2. Recreation time - listen to records.
1. Utilizing a song of the students choice, divide students into two groups having one group singing melodies and the other group accompanying on rhythm instruments.
2. Have students choose two songs that they would like to perform to be worked on in the next session.
3. Recreation time - listen to records.

May 21, 1975

1. Assign singing and instrumental assignments to students in the two songs chosen to be performed in the previous session.
2. Practice the two songs.
3. Record songs and play back for students at the end of the practice.
4. Recreation time - listen to records.

June 1, 1975
(Final Session)

1. Students will meet in the school yard and perform the songs practiced during the previous session. Vocals, guitar, drums, electric organ, and rhythm instruments were used in performing the two songs.
2. Recreation time - listen to records and discuss the successes and failures of the music program with the students.

RECREATIONAL RESOURCE FILE QUESTIONNAIRE.

Circle "Yes" or "No" and complete the answer in the space provided when necessary.

1. Type of agency (Public, private, commercial, therapeutic) _____

Name of Agency _____ Phone No. _____

Address _____ Contact Person _____

2. Is there a membership cost or fee? _____ yes _____ No

If so, how much? _____

3. Is transportation provided? _____ yes _____ no

If not, what means of transportation are close to the center:

List services provided 6 _____

4. What are the days and hours that the facility is open? _____

5. Do you have special programs for the physically or mentally handicapped:

_____ yes _____ no If yes, please list the programs offered:

Are there eligibility requirements? _____ yes _____ no

If so, please explain: _____

6. Do you provide special adaptations of equipment for handicapped persons?

_____ yes _____ no

If yes, please specify: _____

7. Does your facility provide reserved spaces for the physically handicapped?
8. Do sidewalks have curb cuts or ramps? _____ yes _____ no
9. Is there a passenger loading zone? _____ yes _____ no

APPROACH & ENTRANCE TO FACILITY

10. Is there a ramp provided to by-pass the steps? _____ yes _____ no
11. Is the accessible entrance designated for the handicapped? _____ yes _____ no
12. If there are steps, are hand rails provided? _____ yes _____ no
13. Is the ramp equipped with hand rails? _____ yes _____ no
14. What is the width of most accessible entrance doorways (with door open)?

FACILITIES INSIDE OF BUILDING

15. Is the area for public use more than one story? _____ yes _____ no
16. If so, is there an elevator or ramp that is accessible to the other stories?
_____ yes _____ no
17. Are room numbers and other directions accessible to the multiply handicapped?
_____ yes _____ no
18. With regard to restrooms:
- (a) What is the width of entrance doorway (door open)? _____
- (b) What is the width of stall doorway? _____
- (c) Do the stalls have hand rails or grab bars? _____ yes _____ no
- (d) Is there room for a wheelchair inside the stall with door closed?
_____ yes _____ no
19. Is it preferable that arrangements be made in advance for your facility to accommodate the physically handicapped? _____ yes _____ no
20. Would the owner be willing to learn how to make the facility more accessible to the handicapped? _____ yes _____ no
21. If the building is accessible to the handicapped, would the program director be willing to implement a program for the handicapped? _____ yes _____ no
22. Any additional comments: _____

JOB ANALYSIS

Agency _____ Position _____ Salary _____ Referen _____

ACTIVITY	WEIGHT/REACH	ADAPTATIONS		% OF TIME
<p>1. <u>OFFICE PROCEDURES</u></p> <p>Lifting Removing Carrying Stapling Opening Stamping Sorting Unfolding Weighing Collating Filing Turning pages Indexing Scheduling Inserting</p>			<p>3. <u>COMMUNICATION</u></p> <p>Hearing Mobility Speaking Tape Recording Typing Writing</p>	
<p>2. <u>OFFICE MACHINES</u></p> <p>Cleaning Dialing Holding Inserting Lifting Maintaining Opening Pulling Pushing Threading Turning Unlocking Using Keyboard Carrying</p>			<p>4. <u>COGNITIVE REQUIREMENT</u></p> <p>Education Math Prob. Solving Reading Training</p>	LEVEL/TYPE
			<p>5. <u>OFFICE EVAL.</u></p> <p>Entrance Steps Door Door mechanism Floor covering Threshold Obstacles Desk File Cabinets</p>	DIMENSIONS
			<p>6. <u>BATHROOM EVAL.</u></p> <p>Door Grab bars Toilet Sink</p>	DIMENSIONS
			<p>7. <u>CAFETERIA EVAL.</u></p> <p>Accessibility</p>	DIMENSIONS

COMMENTS:

Position	Salary	Reference
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EIGHT/REACH	ADAPTATIONS	% OF TIME	ADAPTATIONS
		3. <u>COMMUNICATION</u> Hearing Mobility Speaking Tape Recording Typing Writing	
		4. <u>COGNITIVE REQUIREMENT</u> Education Math Prob. Solving Reading Training	LEVEL/TYPE
		5. <u>OFFICE EVAL.</u> Entrance Steps Door Door mechanism Floor covering Threshold Obstacles Desk File Cabinets	DIMENSIONS
		6. <u>BATHROOM EVAL.</u> Door Grab bars Toilet Sink	DIMENSIONS
		7. <u>CAFETERIA EVAL.</u> Accessibility	DIMENSIONS



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*Division of Rehabilitation Medicine
Research & Training Center*

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Ross Hall - Room 420

BIO-ENGINEERING SERVICES
TO
DEVELOPMENTALLY DISABLED ADOLESCENTS

Board of Advisors Meeting
March 5, 1975

9:30 - 9:35	Welcome Address and Staff Introduction. Dr. F. Leonard
9:35 - 9:45	Objectives of the Project. K. Mallik
9:45 - 9:55	Cooperation of the Sharpe Health School. M. Siler
9:55 - 10:05	Student and Parent Education. S. Yuspeh
10:05 - 10:15	Functional Evaluations. E. Smith
10:15 - 10:25	Recreational Evaluations. K. Moyers
10:25 - 10:40	Bio-Engineering Adaptations. J. Mueller
10:40 - 10:50	Orthotic Devices. Dr. H. Goller
10:50 - 11:00	Vocational Training. K. Mallik
11:00 - 11:10	Vocational Placement. R. Sablowsky
11:10 - 11:20	Discussant. E. Schoenfeld
11:20 - 12:00	General Discussion and Recommendations.



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BIO-ENGINEERING SERVICES
TO
DEVELOPMENTALLY DISABLED ADOLESCENTS

Participants: Board of Advisors Meeting
March 5, 1975

STAFF

K. Mafluk	Principal Investigator and Bio-Engineer
S. Yuspeh	Research Assistant and Project Coordinator
E. Smith	Occupational Therapist
K. Moyers	Recreational Therapist
J. Mueller	Industrial Designer
R. Sablowsky	Vocational Coordinator
K. Hutcherson	Orthotist Assistant

ADVISORS AND CONSULTANTS

Dr. F. Leonard	Director of Research, Rehabilitation Research and Training Center (RT-9)
Dr. D. Hawkins	Director of Research Utilization (RT-9)
Dr. G. Folsom	Project Director: Life Skill for Developmentally Disabled (RT-9)
T. West	Administrator, Rehabilitation Medicine
Dr. H. Goller	Assistant Research Professor of Orthopaedic Surgery; Prosthetist/Orthotist (RT-9)
M. Siler	Principal, Sharpe Health School
M. Crawford	Coordinator, Physical and Occupational Therapy, Division of Maternal Child Health, Department of Human Resources
K. Singleton	Rehabilitation Counselor, Bureau of Rehabilitation Services, Department of Human Resources
W. Hersey	The John F. Kennedy Institute
E. Schoenfeld	Developmental Disabilities Specialist, Rehabilitation Services Administration, Region III



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BIO-ENGINEERING SERVICES
TO
DEVELOPMENTALLY DISABLED ADOLESCENTS
Sharpe Health School Staff Orientation

March 19, 1975

2:30 - 2:35	Welcome Address - M. Siler
2:35 - 2:45	Objectives of the Project - K. Mallik
2:45 - 2:55	Orthotic Devices - K. Hutcherson
2:55 - 3:05	Student and Parent Education - S. Yuspeh
3:05 - 3:20	Functional Evaluations and Bio-Engineering Adaptations - K. Mallik
3:20 - 3:30	Recreational Evaluations - K. Moyers
3:30 - 3:40	Vocational Training and Placement - S. Yuspeh
3:40 - 4:00	General Discussion and Recommendations.



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BIO-ENGINEERING SERVICES
TO
DEVELOPMENTALLY DISABLED ADOLESCENTS

Sharpe Health School Parent and Student Orientation

March 26, 1975

10:00	-	10:05	Welcome Address - M. Siler
10:05	-	10:15	Objectives of the Project - K. Mallik
10:15	-	10:25	Orthotic Devices - K. Hutcherson
10:25	-	10:35	Student and Parent Education - S. Yuspeh
10:35	-	10:50	Functional Evaluations and Bio-Engineering Adaptations - K. Mallik
10:50	-	11:00	Recreational Evaluations - K. Moyers
11:00	-	11:10	Vocational Training and Placement - S. Yuspeh
11:10	-	12:00	General Discussion and Recommendations.



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BIO-ENGINEERING SERVICES
TO
DEVELOPMENTALLY DISABLED ADOLESCENTS

Participants: Board of Advisors Meeting
June 10, 1975

STAFF

K. Mallik
S. Yuspeh
R. Sablowsky

Principal Investigator and Bio-Engineer
Research Assistant and Project Coordinator
Vocational Coordinator

ADVISORS AND CONSULTANTS

Dr. F. Leonard
Dr. D. Hawkins
M. Crawford

M. Siler
W. Hersey
M. Shoob

Director of Research, Rehabilitation Research
and Training Center (RT-9)
Director of Research Utilization (RT-9)
Coordinator, Physical and Occupational
Therapy, Division of Maternal Child Health,
Department of Human Resources
Principal, Sharpe Health School
The John F. Kennedy Institute
Program Management Officer, Office of Research,
Rehabilitation Services Administration, HEW

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